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INTERNATIONAL ABSTRACT OF SURGERY

JANUARY, 1920

ABSTRACTS OF CURRENT LITERATURE GENERAL SURGERY—SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE

Cardenal, L.: Conclusions Drawn from a Statistical Study of More Than Two Thousand Consecutive Operations for Hernia (Conclusiones deducidas de una estadística de más de 2,000 operaciones consecutivas de hernia). *Med. Ibero*, 1919, Número extraordinario, 1 Cong. nac. de med. y cirug., 46.

The principal methods used in the treatment of inguinal hernia and their percentages of recurrence were as follows: Lorthioir method, 0.29 per cent; Kocher method, 1.3 per cent; Lucas-Championnière method, 34.6 per cent; and Bassini method, 8 per cent. Therefore preference should be given first to Lorthioir's method (children up to 10 years of age), and second, to the classical method of Kocher which may be used without danger in over 80 per cent of cases. The Bassini method, which held third place as regards the number of recurrences, should be reserved for cases in which the sac cannot be invaginated and, with the author's modification, for cases of direct inguinal hernia. The Lucas-Championnière method should be abandoned entirely. The mortality in the radical treatment of inguinal hernia, including every type of accident, was 0.2 per cent.

For the correction of crural hernia preference should be given to the method of Kocher (invagination and transplantation of the sac above Poupart's ligament). This method is practicable in the great majority of cases and is followed by a recurrence of the condition in only 2.6 per cent. When it is not practicable, the author sutures and extirpates the sac and closes the ring, suturing Poupart's ligament and the aponeurosis and the pectineus muscle. When the ring is very large he uses grafts and transplants. In the 216 cases of crural hernia included in the statistics there was not one death.

In the treatment of umbilical hernia Cardenal has reduced the percentage of recurrences to 2.8 per cent with the use of his own modification of the Mayo method. The mortality of operations for umbilical hernia is comparatively high, being 1.3 per cent.

The number of epigastric, lumbar, and other types of hernia operated upon by the author is too small to justify conclusions regarding them.

M. M. MATTHIES.

Yount, C. C.: The Rôle of the Provisional Appliance in the Treatment of Amputations of the Lower Extremities. *N. York State J. M.*, 1919, xix, 339.

Commercial provisional legs are comparatively little used because it is unsatisfactory to provide at a low cost for the adjustment of an appliance so that it will continue to fit a rapidly changing stump that is tender and boggy. To use a "shrinker" or cuff of leather, constructed to fit the stump and provided with a lacer for compression, is an apparent fallacy.

Atrophy, however, must be avoided and hyperdevelopment obtained by exercise of muscle groups proximal to the weight-bearing part of the stump. Since in amputations below the knee the weight-bearing is distributed among cone bearing, bony prominence bearing, thigh surface bearing, and end bearing, the ideal provisional appliance should develop these bearing points and surfaces by various excavations and additions, and should be changed in shape and position frequently. Adjustments in alignment must be made on account of changes in the position of the stump with relation to the axis of weight bearing. The provisional appliance must also possess an ankle-joint in order to save unnecessary trauma to the stump.

The stock appliance can be used in 85 per cent of thigh amputations, but only in 50 per cent of leg amputations. For the remaining cases a special prosthesis is made, the value of which depends on the construction of the socket. A sock made of eiderdown is dipped into heated paraffin, slightly cooled, and then drawn onto the stump to which it is carefully fitted, especially under the head of the fibula, the tuberosity of the tibia, and over the head of the tibia. After cooling, plaster of Paris or

Keen's surgical cement is applied and strips of thin sheet iron are used as rivets.

For thigh stumps the socket is formed in a similar manner, a careful mold being made for the ischial tuberosity. At the Walter Reed Hospital it has been found that the best way to fit the changing socket is to supply a new socket, usually at the end of the second, fourth, and sixth weeks when latterly the patient is recommended for discharge. He is then instructed to wear the provisional appliance for at least four months longer before applying for the permanent artificial limb.

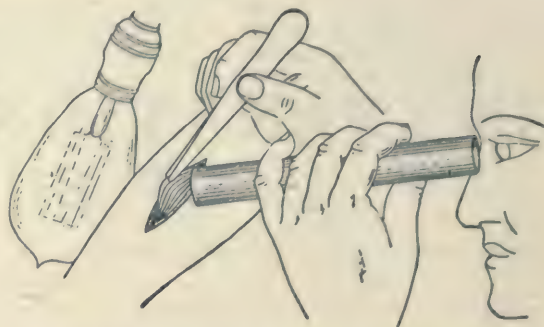
R. G. PACKARD.

Bettman, A. G.: The Removal of Foreign Bodies from the Tissues by the Use of Transillumination. *J. Am. M. Ass.*, lxxiii, 766.

The difficulty often encountered in attempting to remove foreign bodies from the tissues is well known. Even when roentgenograms are at hand or when fluoroscopy has been done, there is frequently great difficulty in removing the foreign body.

By the use of transillumination, any foreign body that will cast a shadow may be located in a surprisingly short time.

Having cut down to the supposed location of the foreign body and having arranged the light, the operator looks through a tube at the tissues, which may be



Method of locating and removing foreign bodies from the tissues by the use of transillumination.

held up or otherwise suitably manipulated. A dark room is unnecessary. When once the foreign body is located, it is a simple matter to remove it. Reference to the illustration will make the method clear.

The tube may be of any suitable material, brass or other metal or a darkened test tube; in an emergency, a roll of paper may be employed.

The angle at which the tube is used may be varied to meet conditions. Frequently even deeply embedded material may be located without the necessity of putting the end of the tube into the wound.

SURGERY OF THE HEAD AND NECK

HEAD

Hastings, S.: A Case Showing a Method of Repair of the Right Side of the Nose. *Proc. Roy. Soc. Med.*, Lond., 1919, xii, Sect. Laryngol., 110.

Hastings repaired a defect of the right side of the nose due to injury by turning forward a flap formed of cartilage and bone from the septum and mucous membrane of the right side only, leaving the left side intact as in the operation of submucous resection, and at once covering the exposed cartilage and bone with a pedicled flap from the forehead. At a subsequent operation the base of the pedicle was divided and the patency of the nose restored by dividing the septal mucous membrane of the right side in the line of its reflection. O. M. Rorr.

Hett, G. S.: Methods of Repair of Wounds of the Nose and Nasal Accessory Sinuses. *Proc. Roy. Soc. Med.*, Lond., 1919, xii, Sect. Laryngol., 117, 136.

There are many methods of restoring a lost ala nasi. A flap may be brought down from the side of the nose or turned in horizontally from the cheek. This flap may contain a previously embedded piece of cartilage or may be attached over an inferior turbinal which has been swung across the gap. Skin may be turned down from the nose to form the lining of the new vestibule. However, as the outer portion of the ala often tends to contract upward and

in this way ruin the contour, Hett recommends the use of a flap from the cheek made with its base above. This is rotated inward, attached to the nose over turned-down skin or turbinal, and may contain embedded cartilage.

When it is necessary to form alæ, tip, and columella, an extension of the last flap may be employed. The flap is cut in a Y-shaped form, the upper limb of the Y making the columella and support for the tip. The lower limb forms the ala of the opposite side. The portion between the short limbs of the Y is made to include some fatty tissue and forms the tip. The pedicle of the flap forms the ala of the same side.

When there is still greater loss of the alæ, tip, and columella, as in the Indian mutilation type, a forehead flap is indicated. Hett employs a modification of the Keegan-Smith operation. The mucous membrane is divided over the septum and raised as in a submucous resection. The septal cartilage is then divided submucously, except at its anterior inferior angle, and swung forward. A bisected triangle of skin from the bridge of the nose is then turned down and sutured to the septal mucous membrane. Finally, a forehead flap is brought down with a very wide columella which wraps around and covers the projecting piece of septal cartilage.

For extensive loss of the nose with an opening between the antrum and the cheek the following operation may be done: An L-shaped piece of sep-

tum covered with mucous membrane is cut free, except above where it is left attached. It is swung forward, and the end of the short limb of the L attached to a groove cut in the region of the nasal spine. A full thickness flap is cut out of the nasal cavity so that it swings forward like a door, the hinge corresponding to the anterior edge. Its free edge is attached to the septal swing and fills up the right half of the gap in the nose. The lining of the right half of the external nose is thus formed by antral mucous membrane. The left side is covered in by an in-turned skin flap. At the next operation the remains of the left ala are adjusted and used for the lining of the left vestibule. The lining of the right vestibule is formed by a turned-up labial flap which is attached to the lateral wall swing and to the septal swing. A forehead flap is brought down over the whole after removal of the mucous membrane from the superficial surface of the lateral nasal wall swing. Subsequently, the proximal end of the pedicle is cut loose from the forehead with a flap which is designed to cover the opening into the antrum from the cheek. Lastly, the portion of pedicle between the nose and cheek flaps is cut away.

Hett has frequently employed this principle of the reversed forehead pedicle for various purposes, such as the formation of nose and eyelid or to give an additional prominence to the tip of the nose.

In cases of loss of a portion of one side of the nose, a skin flap may be turned in to cover the opening, either from the opposite side of the nose or from the same side of the cheek. Another method is the lateral septal swing. The next stage is to remove the mucous membrane from the outer surface of the septal swing and bring down a forehead skin flap.

For wounds causing loss of the bridge of the nose and the nasal and septal supports (pug-nose type) the operation consists in cutting free the alæ and tip and bringing them down into the normal position. This leaves a gap in the nose which has to be covered over by lining flaps made from the skin of the sides of the upper part of the nose.

A very useful method of forming a new bridge and holding the tip in correct position consists of implanting a rod of cartilage which is turned down on a hinge of skin and soft parts and attached to the tip. The sides of the opening are then covered in with skin flaps and a forehead flap is brought down.

Wounds causing loss of the bridge of the nose and nasal supports without marked deformity of the tip (bird-beak type) require a forehead flap to fill the gap. If the nasal cavities are open a turned-in skin flap must be used to cover the gap.

Hett presents the following cases:

Case 1. This case illustrated a method of overcoming the deformity left after a wound of the frontal sinus. A forehead flap was brought down over the depression to restore the contour. In such cases a piece of costal cartilage may be inserted subcutaneously to form a new brow ridge.

Case 2 was a case of total loss of the nose. Pieces of cartilage were implanted into the sides of the nose

to reproduce the supports which were lacking, i.e., the nasal processes of the superior maxilla. Lining flaps of skin containing the cartilage were turned inward with lateral prolongations which, when twisted into position, formed the lining of the vestibule of the new nose. A very large forehead flap was then brought down and subsequently cartilage was implanted subcutaneously in order to reproduce the prominence which should be formed by the nasal bones and cartilaginous bridge.

Case 3 illustrated the use of a reversed pedicle forehead flap to form a lower eyelid and to repair a deficiency of the bridge of the nose.

Case 4 illustrated the employment of a forehead flap containing the anterior division of the superficial temporal artery. This flap has an excellent blood supply and is useful in many cases, especially scarring of the forehead. It renders the use of the ordinary forehead flap containing the angular and supra-orbital arteries impossible.

Case 5 illustrated the principle of chest flap rhinoplasty. In this case a portion of the new nose sloughed. Hett states that it is difficult to get a chest flap to live more than $3\frac{1}{2}$ inches beyond the tube of the pedicle.

E. H. POOL.

Cope, V. Z.: Acute Necrotic Parotitis. *Brit. J. Surg.*, 1919, vii, 130.

The author reports seven cases of an acute inflammatory condition of the parotid gland to which he has applied the term "acute necrotic parotitis." While the immediate exciting cause was bacterial infection with staphylococci or streptococci, excessive heat or debilitating disease are emphasized as more important elements. Infection took place along Stenson's duct or from some septic focus in the body. Pathologically an extensive gangrenous condition may be found which in some cases involves both glands. If incision is done early, little or no discharge results. Later a copious purulent discharge with slough appears. Spontaneous rupture of the discharge usually takes place into the external auditory meatus.

Clinically a swelling in the region of the parotid accompanied by fever of 102 to 104 degrees and general symptoms of malaise are common. If free incision of the gland is done, recovery usually follows after the substance of the gland has come away by sloughing. No case of facial palsy has been seen.

In the treatment the author emphasizes the importance of making free incision into the substance of the gland at the earliest opportunity. He considers a small incision as being futile and often fatal. Incisions found useful were a large inverted T-shaped cut at the angle of the jaw, a straight or T-shaped incision in front of the auricle, and a straight incision behind the auricle over the mastoid. The after-treatment consisted of the application of fomentations and frequent dressings. In the seven cases reported there were three deaths, one of which was due to an associated empyema of the gall-bladder.

W. J. TUCKER.

NECK

Kerr, W. J.: A Preliminary Survey of the Thyroid Gland Among Twenty-One Thousand One Hundred and Eighty-Two Recruits at Camp Lewis, Washington. *Arch. Int. Med.*, 1919, xxiv, 347.

Among 21,182 recruits examined at Camp Lewis, Washington, the thyroid gland was found to be enlarged so that it could be felt distinctly on swallowing in 4,693 (21 per cent).

The recruits examined were from Washington, Oregon, Montana, Idaho, Wyoming, Minnesota, Utah, North and South Dakota, Nevada, and California. In these states the incidence of thyroid enlargement is highest in Washington and Oregon, i.e., 30 to 40 per cent, and lowest in California and Nevada, i.e., under 10 per cent. Goiter is endemic in the Pacific Northwest, shading off southward and eastward. In the latter direction, however, Minnesota with 20 to 30 per cent represents the endemic region of the Great Lakes.

Exophthalmic goiter was very rarely seen in troops coming to Camp Lewis although many recruits were rejected because of thyroid enlargement producing pressure symptoms or interfering with the wearing of the military collar. Cases of exophthalmic goiter were rejected by the local boards. The enlargement of the thyroid gland

involved the isthmus in 52 per cent, the right lobe in 5 per cent, and the left lobe in 4 per cent. In 38 per cent it was diffuse.

The family history of recruits with enlarged thyroid glands showed that goiters had been noted in sisters three times more frequently than in brothers, and in mothers ten times more frequently than in fathers.

There was no evidence to indicate that enlargement of the thyroid gland diminishes in frequency between the ages of 21 and 31 years.

Such physical signs as tremor, tachycardia, vasomotor instability of the hands, and curved nails were noted and found in a larger percentage of men with thyroid enlargement than in those without demonstrable changes in the thyroid. The differences, however, were not striking, and no definite conclusions can be drawn at this time.

No definite conclusions can be drawn as to the etiological factors in the production of endemic goiter. The region affected corresponds roughly to the glaciated areas of the United States. There is apparently some relation between the condition and the water supply.

The geographic distribution has been shown by states. Similar statistics by counties in each state have been compiled, but for want of space are not included in this report.

K. L. VEHE.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Norrlin, L.: A New Case of Double Metapneumonic Empyema. Operation and Recovery (Sur l'empyème double métapneumonique à propos d'un cas nouveau. Intervention; guérison). *Acta chirurg. Scand.*, 1919, lli, 55.

The author's rare case of bilateral metapneumonic empyema was that of a girl aged 8 years and followed an attack of influenza in the recent epidemic. Expectant treatment was given, but as the patient daily grew worse, it was decided to operate. In both pleuræ there was a thick creamy pus exudate containing only diplococci.

At first about 150 grams of pus were aspirated from each pleura by puncture. On the following day after aspiration of another 150 grams from the right pleura an intercostal incision was made in the eighth space on the right side and through this ½ liter of pus was evacuated. Following temporary improvement, there was a severe relapse. Thoracentesis was then done on the left side and 300 grams of thick pus were removed. The patient's condition, however, grew gradually worse and progressed to a point where she would have succumbed if a sufficient opening for the evacuation of pus from the left pleura had not been made. A half liter of pus was removed by a posterior thoracotomy on the left side.

All these operations were done under local anesthesia. After the intervention the fever fell rapidly and the patient progressed to recovery.

Gierz in reporting in 1913 on 588 cases of pleural empyema treated in the Swiss hospitals stated that a double purulent pleurisy was found in only 5 cases. Only one patient recovered. Cases of recovery from double pleurisy are rare. The present tendency in surgical treatment is to simplify the technique and to operate as conservatively as possible. Norrlin believes that when operation is required, a primary thoracotomy will give better results than aspiration.

Surgeons generally are cautious in recommending a simultaneous double pleurotomy even when the empyema is not encapsulated by the pleuræ.

It is impossible to lay down precise rules in advance for such cases. As regards his own case Norrlin is confident that the patient's feeble condition would not have permitted simultaneous double pleurotomy. He concludes:

1. That cases of bilateral metapneumonic (pneumococcic) empyema may be cured by an early surgical operation which can be done in any clinic.
2. That in urgent cases a simultaneous double pleurotomy is permissible, but that the best results are obtained from puncture, thoracotomy, if necessary, being deferred until pleurotomy of the other side has been done and has healed.

W. A. BRENNAN.

Ward, F. N.: Mammary Carcinoma: Frequency of Recurrence Following a Radical Operation.
J. Am. Inst. Homœop., 1919, xii, 279.

The present surgical success in the treatment of mammary carcinoma dates back to William S. Halsted's brilliant report on the results of operations for mammary carcinoma at Johns Hopkins Hospital from June, 1889, to January, 1894. Halsted's list showed no primary mortality and but 6 per cent of local recurrences. Up to this time surgical treatment had been an almost complete failure as regards a cure and the primary mortality had been high. Billroth's primary mortality was 23 per cent. Halsted's excellent results are to be attributed to: (1) the removal of the pectoralis major and minor muscles; (2) the removal of the axillary contents; and (3) wide skin incision and removal of the mass *en bloc*.

The author describes the technique of modern radical excision, adding to the three steps mentioned a large and wide dissection of the deep fascia covering the muscles in proximity to the breast. By this operation there is no reason why from 80 to 100 per cent of cures should not be obtained if the patients are brought for operation sufficiently early, i.e., while the tumor is still small and mobile and there is no palpable enlargement of the axillary glands. As it is, the statistics of cases following radical removal, such as those of Deaver, Halsted, and Mayo, show only 44 per cent of cures.

It must be borne in mind that any lump in the breast is cancer or potential cancer and demands immediate removal.

Isaac Levin has offered a valuable contribution in his report on the frequency of metastasis in the bones in mammary carcinoma. So impressed is he with this occurrence that he makes a roentgenographic examination of the skeleton as a routine in all cases of cancer of the breast. The author feels that every case should have the benefit of radium and X-ray therapy.

The article is closed with the report of five cases of double mammary involvement and a tabulation of twenty-seven cases of benign and malignant tumors of the breast. R. B. BETTMAN.

TRACHEA AND LUNGS

Fagioli, A.: Primary Echinococcosis of the Lung
(Sulla echinococcosi primitiva del polmone). *Riforma med.*, 1919, xxxv, 498.

Up to a few years ago before the advent of the radiological examination primary localization of the echinococcus in the lung was believed to be exceptionally rare, and even today, eliminating the frequent and easily made diagnostic errors, it is not often observed.

The clinical diagnosis of hydatid cysts of the lungs is always difficult. There is no characteristic syndrome, the clinical symptoms being only such as are commonly observed in other pulmonary conditions; eosinophilia is variable and manifested with

other lesions, and complement deviation is usually not effected until rupture of the cysts or operative intervention. The only sign of positive value is the demonstration of the parasite in the sputum which is rarely possible.

The author reports the case of a soldier who, when in fairly good condition, was suddenly seized with severe hæmoptysis. About 250 cubic centimeters of blood were ejected. Examination showed signs of pulmonary infiltration in the right clavicular region and pleural effusion on the same side. The Koch bacillus could not be demonstrated but there was a weakly positive cuti-reaction to tuberculin. An exploratory puncture was not done. The patient was sent for radiological examination with a clinical diagnosis of bronchopneumonia infiltration in the upper and middle right lobe and pleurisy with effusion on the right side. Radiology, however, established the presence of three large hydatid cysts, two of which were situated in the thickness of the pulmonary parenchyma and the third in the posterior part of the pleura.

Through an exploratory puncture made posteriorly in the eighth intercostal space perfectly clear limpid fluid was evacuated. This was followed by symptoms of anaphylaxis. Examination of the sputum thirty-six hours after the puncture showed a considerable number of eosinophile cells. Complement deviation with the cystic fluid as antigen and bovine echinococcus cyst fluid was clearly positive. The patient refused operation, left the hospital, and has not been heard from since. W. A. BRENNAN.

Hedblom, C. A.: Pulmonary Suppuration. *Med. Rec.*, 1919, xcvi, 441.

This article is based on a study of 80 patients at the Mayo Clinic since 1918. Fifty-four were operated on, 1 progressed to a complete cure, and 1 to a partial spontaneous cure. In 16, pulmonary suppuration occurred as a complication of operation for other conditions; 8 were practically moribund at admission.

In the first group the abscess developed on a preceding inflammatory lung condition in 25 per cent. Presumably there was evidence that the infection had been carried to the lung by foreign material (detritus during tonsillectomy, teeth extraction, etc., and other foreign material in 25 per cent). In 18 per cent there was a possibility of infection by direct extension from an adjacent inflammatory process (empyema, peptic ulcer, abscess, etc.). In 33.6 per cent of the non-operative cases, the abscess followed operation for malignant disease. In 66.6 per cent of the same group the abscesses were multiple.

A chronic productive cough was the most characteristic symptom. The onset of sputum was gradual in at least half of the cases; tuberculosis bacilli were found in 1 case only. Elastic-tissue fibers were found in 2 of 14 cases. Dullness to percussion was the most characteristic sign and was present in 62 per cent of the cases.

The differential diagnosis lay chiefly between abscess and localized bronchiectasis on one side, and tuberculosis, encapsulated empyema, and generalized bronchiectasis on the other. In 17 of 56 cases there was evidence of a primary or an associated tuberculous lesion. Seven of the 17 patients died, and 9 improved or were entirely relieved of their symptoms by operation. A post-mortem examination was made in 6 of the 7 fatal cases. In 2, a tuberculous process was found in addition to the abscess. In the remaining 4 cases an abscess was found but no tuberculosis.

Of 7 cases of bronchiectasis a definite pre-operative diagnosis was made in only 2. In 3 cases not included in this series exploration was made for malignant disease.

Primary drainage was effected in 29 of 54 cases. In the remainder a two-stage operation was performed.

The author considers the two-stage operation safer in all cases in which extensive adhesions are not definitely made out at operation. His operative technique is described in detail.

Pleural adhesions were firm and extensive in about 50 per cent of the cases. Primary drainage was performed in 5 instances in which there were no adhesions. One of these patients died of empyema. In 11 instances in which the abscess was drained in a one-stage operation the pleural cavity was opened. Three of these patients died of empyema.

The abscess was located in the right lung in 74.5 per cent and in the right lower lobe in 50

per cent. The cavities were multiple in 23.4 per cent.

The operative mortality was 33.3 per cent for the whole group, and 23.5 per cent for the last 17 cases.

The article includes a number of tables on incidence, etiological factors, symptoms, signs, operative findings, mortality, postoperative complications and sequelæ, and necropsy findings in the fatal cases. There is also a historical survey and a comprehensive bibliography.

PHARYNX AND ŒSOPHAGUS

Keiper, G. F.: Tight Strictures of the Œsophagus in Children Due to Lye Burns. *Laryngoscope*, 1919, xxix, 548.

In addition to a case report the following salient points are presented:

1. The etiology of strictures of the type described lies primarily in gross carelessness.

2. Laws should be enacted and enforced requiring the poison label to be attached to containers of concentrated lye as well as of the various cleansers on the market.

3. Passage of a bougie should not be attempted at once as the walls are soft, due to the corrosive action of the chemical, and perforation is apt to result.

4. Dilatation should be undertaken only under direct inspection.

5. No anæsthetic is necessary. O. M. ROTT.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Bolognesi, G.: The Pathogenic Mechanism of Hernial Strangulation (Sur le mécanisme pathogénique de l'étranglement herniaire). *Arch. de méd. expér. et d'anat. path.*, 1919, xxviii, 403.

Bolognesi presents an experimental and clinical study of strangulated hernia and reviews the various theories regarding the mechanism of strangulation. Most of these have some basis in fact, but all are insufficient in that though they may agree that the pathogenesis of hernial strangulation is mechanical, they do not take any account of the vital phenomena which are of great importance in the formation of hernial incarceration.

In a number of experiments on dogs the author attempted to make the cause of strangulation intervene while the vitality in the incarcerated intestinal loop was maintained. Having performed an aseptic supra-umbilical median laparotomy on a dog, he isolated and looped a segment of intestine and passed it either through a rigid or an elastic ring into an artificial sac of sterile rubber or canvas.

In 11 experiments he found that attempts to produce strangulation of an intestinal loop in such an

artificial sac were not successful when rigid neck rings were used or even rings with very reduced elasticity. On the other hand, when the ring of the sac was elastic, strangulation occurred almost constantly. In such cases the hernia was irreducible at the time of the experiment and when left to itself a true strangulation developed secondarily with constriction of the intestine and more or less occlusion of the venous vessels. The influence of fullness or emptiness of the intestinal loops at the time of experiment on the production of strangulation was not clearly determined. The vitality of the loop does not depend upon the duration of the strangulation; in one experiment necrosis occurred after twelve hours while in others the loop was still alive after six days.

In drawing conclusions from his experimental findings as to the etiology of the condition, the author reviews some facts observed clinically. During four years in a total of 550 hernia cases he has seen 107 strangulated herniæ. Of these 107 herniæ 60 were inguinal and 47 crural. In 45 per cent of the cases of strangulated inguinal hernia the hernia was reduced, the reduction being followed by a radical operation for the cure of the hernia. In 55 per cent

immediate operation for emptying the sac was necessary. In only 6 per cent of these latter was resection required to empty the sac, and in only 3 per cent was the vitality of the loop doubtful. In the cases of crural strangulated hernia, immediate surgical operation for reduction was done in nearly every instance. In the cases of inguinal and crural hernia there was no relation between the gravity of the anatomical lesions in the herniated viscera and the time at which incarceration occurred. Especially in old persons the viscera seemed to tolerate strangulation well.

On the basis of his experimental and clinical data Bolognesi believes that the inguinal and crural rings involved in hernia have not been sufficiently studied and not enough is known regarding their elasticity. Exclusive of Scarpa's spasmodic contraction and the elastic action described by Richer, the herniating rings have a certain amount of elasticity due to the fibrous elements which compose them.

The conclusions drawn by the author are as follows:

1. Strangulation of a hernia is an essentially mechanical fact which ought to be viewed in its relations to vital phenomena. In the young the fibrous herniating rings, the mechanical agents of strangulation, are more elastic than in the old and hence more apt to cause strangulation. At the same time, however, the blood vessels are more tolerant of mechanical interference with their circulation. In the old the fibrous rings are more rigid, but sclerosis of the vessels plays an important part in strangulation.

2. The elasticity of the herniating ring is of prime importance.

3. Strangulation of a hernia is a complex phenomenon and most of the theories propounded to explain it have some basis in fact.

4. The intestinal loop incarcerated in a hernial sac may be converted from an irreducible hernia to a strangulated hernia as the result of vascular and fermentative phenomena.

5. A herniated intestinal loop, rendered irreducible by muscular contraction, becomes secondarily strangulated as a result of the continued increase in disproportion between the hernial opening and the volume of the herniated mass (congestion, vascular transudation, secretion, and fermentation in the loop).

6. The variety in degree and form of strangulated herniæ is due to the complexity of the pathogenic factors involved, and especially to the variation in the resistance of the loop to the effect of the strangulation.

W. A. BRENNAN.

GASTRO-INTESTINAL TRACT

Lowenburg, H.: Pyloric Obstruction of Infancy.
Pennsylvania M. J., 1919, xxii, 712.

Lowenburg objects to the prevailing nomenclature used in describing the pyloric obstruction of infancy, believing that the terms "surgical pyloric obstruc-

tion of infancy" and "non-surgical pyloric obstruction of infancy" should be substituted. Under these headings he describes the symptoms and treatment.

As surgical pyloric obstruction in infants he regards all cases in which the symptoms indicate complete obstruction or incomplete obstruction of such a degree that not sufficient nourishment can pass to permit at least the maintenance of nutritional balance. The symptoms are continuous depression of the weight curve, non-fæcal or slightly fæcal stools of small bulk, and continuous and severe propulsive vomiting.

As non-surgical cases he regards those in which sufficient nourishment passes to maintain the nutritional balance at least for a more or less extended period of time and those in which there is but slight loss in weight and the weight-curve shows alternate losses and gains though its general trend is horizontal. Constipation is present but not complete; vomiting varies in intensity.

Surgical treatment is posterior gastro-enterostomy, Rammstedt's operation and Strauss' operation. The latter has the simplicity of Rammstedt's method and reconstructs the pyloric muscle.

Medical treatment is usually directed to control the vomiting. This may be met by: (1) dietetic management; (2) stomach washing; and (3) medicine. Breast feeding or highly alkalized artificial food should be given and the stomach washed once or twice a day with warm bicarbonate of soda solution. Bromides are all that medical treatment has to offer.

H. A. MCKNIGHT.

Gray, H. T., and Pirie, G. R.: Congenital Hypertrophic Stenosis of the Pylorus: Its Diagnosis and Treatment. *Lancet*, 1919, cxcvii, 515.

This article is a detailed study of the diagnostic criteria and treatment of a series of cases of congenital hypertrophic stenosis of the pylorus. The authors believe the usually poor results obtained are due to the fact that the treatment is largely empirical and not based upon an appreciation of the etiology of the condition. The variability of published figures is the result of the difficulty of arriving at a correct diagnosis in doubtful cases.

The signs and symptoms in order of their importance are: (1) the presence of a palpable tumor in the region of the pylorus; (2) visible gastric peristalsis; (3) and projectile vomiting. Associated with these may be (4) phimosis, and (5) constipation in varying degrees. As a rule the age of onset is also of importance.

The one certain sign is the presence of a tumor which is usually found just outside the outer border of the right rectus in the transpyloric plane. There is a characteristic sensation of a marble rolling away from the finger. Such tumors are divided roughly into two groups: (1) the large, hard, avascular type, and (2) the small, hard, vascular type. The variability in size accounts for the fact that in many cases a tumor is not discovered. Other causes for failure may be: (1) dilatation of the stomach,

(2) difficulty in palpating deeply on account of the presence of the liver, and (3) the better developed abdominal muscles in older children.

Examination is best made at feeding time when the pylorus is uncovered by the dragging on the fundus and peristalsis is present. The authors recommend examination from the patient's left side with the thoroughly warmed left hand. The visible peristalsis is an evidence that the tumor causes a marked degree of obstruction at the outlet of the stomach. Spasm may do the same. The projectile vomiting is similar to any vomiting from obstruction, but the vomitus is never bile-stained. As the stomach dilates the vomiting becomes less frequent but more copious. Of these three cardinal symptoms, the authors believe only the first is of paramount importance.

The number of cases of true congenital hypertrophic stenosis of the pylorus is but a fraction of those reported.

Constipation is usually marked. The bowel movements are small, hard, and infrequent. The size of the stool indicates the degree of obstruction, and the consistency, the degree of secretory inhibition.

In males with congenital hypertrophic stenosis there is a constant association with phimosis or an adherent prepuce. The authors concede the possibility of pyloric spasm produced either by direct afferent nerve stimulation upon the sphincter or by excessive stimulation of the suprarenal hormone, or both simultaneously. Symptoms usually occur about the third week. Obstinate projectile vomiting should lead to a thorough examination. In the series of 84 cases studied only 13 of the patients were girls. Girls show the symptoms later and recover more slowly, but the sex difference is more apparent than real. From their study, the authors conclude that in Jewish subjects with congenital pyloric hypertrophy symptoms of obstruction will develop in as many girls as boys.

In the discussion of the treatment only cases that were operated upon at the hospital in Great Ormond street are included. Up to April, 1918, there had never been a recovery after operative interference. Three types of operation used were: (1) gastro-enterostomy, (2) Loret's operation, and (3) Rammstedt's operation. The series in each type was not large. Gastro-enterostomy was performed in four cases, and two of these patients died. The operation was discarded because death occurred in the two most favorable cases. After operation the condition is sure to be critical. Another objection to the procedure is that gastro-enterostomy does not reduce the hypertrophy but merely short-circuits the obstruction.

Seven cases were treated by Loret's operation with one recovery. Four patients died directly after the operation and two within a month. Vomiting occurred postoperatively in three cases but no visible peristalsis was observed. Spasmodic breathing was noted on several occasions during the

operation, and was attributed to some violent afferent vagus stimulus which inhibited respiration much like a blow in "the wind." Chief among the many objections to this operation is its lack of precision. It is always septic, can never be completed in less than fifteen minutes, and cannot be performed in advanced cases as a life-saving measure. The risk of recurrence is also not a negligible factor.

Rammstedt's operation was performed on seventeen patients, ten of whom recovered. The records of the cases operated upon by this method are given in detail and several points in the technique of the procedure are emphasized. Because of the structure and relations of the mucous membrane of the hypertrophied portion and the adjoining stomach and duodenal structures, the authors limit their incision of the pylorus on the proximal side by the point where venous oozing begins and on the distal side just short of the pyloroduodenal juncture. In performing the operation they use a special knife with a semicircular cutting blade on one side and a blunt separator on the other. The abdomen is opened about $\frac{1}{2}$ inch below the costal margin at about the juncture of the middle and outer thirds of the right rectus. The incision, which is about $1\frac{1}{2}$ inches long, is carried through the rectus fascia and the muscle is split. To avoid traction it is best to hold the stomach wall near the pylorus out of the wound with the right hand, while pressing the abdominal wall back behind the pylorus with the left hand, rather than to bring the pylorus up to the abdominal wall. The site of the incision in the pylorus should be as far toward the posterior side as possible so that it will come into natural alignment with the lesser curvature. Finally, after exposure of the mucosa, the latter is freed from the muscle by the blunt separator. The whole operation occupies from five to seven minutes without hurry. Adequate division of the seromuscular coat on the gastric side is the most important point to be borne in mind.

The total mortality rate of all cases operated upon by this method was 41.1 per cent. All complicated cases being excluded, the authors state their mortality was 23 per cent, while in the favorable or early cases it was 9 per cent. In the discussion of the three types of operations emphasis is put upon the fact that no patient was operated upon before palliative treatment had failed, and none was refused operation on account of poor physical condition.

In the further discussion of the treatment the authors take up the subsidiary conditions adding to the stenosis produced by the antenatal hypertrophy and initiating the obstructive symptoms. They are: (1) inhibition of pancreatic secretion, (2) gastritis, (3) spasm due to phimosis; and (4) spasm due to unknown causes. These contribute to the precipitation of symptoms by the recurring spasm which they produce or by maintaining the spasm over a long period of time.

Radical treatment is advocated when the secretory inhibition is established at once by a maximum

amount of congenital hypertrophy at birth and a minimum effect from added causes. Palliative treatment should be instituted until the influence of the added causes is determined. In all cases, the diet should consist of peptonized milk. The feeding interval and quantity need not be modified. Gastric lavage should be performed once or twice a day to obviate the gastritis. Rectal lavage or an oil enema is sufficient for the constipation. Cathartics are contra-indicated.

In cases of extreme congenital hypertrophy or for frail, puny babies radical treatment should be instituted at once, that is, within from ten to twelve days after treatment is begun. The palliative treatment should be carried out for from ten to twelve days and all contributing influences of spasm should be eliminated. If within this time vomiting has not ceased, or at least if its projectile quality has not decreased, and the stools have not become more normal, operation is indicated. Operation should be performed as soon as it is definitely demonstrated that palliative measures are useless.

Postoperatively such children should be fed peptonized milk for from ten to twelve days. When the stools indicate a return of the normal outflow of pancreatic secretion, they should be fed as normal babies. Aside from shock, there is no indication for the administration of drugs. Blood transfusion may be of value for particularly feeble patients.

O. C. MELSON.

Taylor, J.: Operative Treatment of Peptic Ulcer.
Practitioner, 1919, ciii, 194.

The author presents the details of cases of gastric conditions submitted to surgical treatment in an army training center. The operations performed and mortality were as follows: posterior gastro-enterostomy, 60, with 1 death; excision of ulcers, 3, with 0 deaths; and partial gastrectomy, 2, with 0 deaths.

In all of these operations evidence was found of obstruction at the duodenojejunal flexure due to changes in the upper part of the alimentary tract brought about by chronic intestinal stasis.

Owing to the drag of loops of small intestine overloaded with feces, the highest part of the jejunum is pulled strongly down and to the right and in this manner the flexure is made very acute. The duodenum then distends and dilates. It yields more on the convex surface, and in its first portion which is least supported. Congestion of the mucous membrane develops and slight abrasions are soon converted into ulcers. Follows then a spasm of the pylorus. The stomach distends and by the aid of an overloaded transverse colon drags down on the lesser curvature which is its fixed portion. Ulcers then occur at the lesser curvature owing to this tearing strain or at the pylorus owing to the resistance of the pyloric spasm to the passage of food. These conditions are readily relieved by the Mayo gastro-enterostomy which overcomes the acute flexure at the duodenojejunal juncture.

Hæmorrhage after operation was never troublesome. In a case of rather marked bleeding which occurred ten days after operation the patient recovered when the stomach was allowed to rest.

The detailed report of a case of hour-glass stomach which was relieved by partial gastrectomy is followed by the clinical abstracts of 6 cases of pronounced fatal hæmorrhage in which a posterior gastro-enterostomy was done. Four of the patients recovered and 2 died.

The article is concluded with a short note by Abrahams in which posterior gastro-enterostomy is strongly endorsed, particularly as an emergency measure.

P. M. CHASE.

Borchgrevink, O. C.: The Results of the Operative Treatment of Gastric and Duodenal Ulcer
(Résultat du traitement opérative de l'ulcère de l'estomac et du duodénum). *Acta chirurg. Scand.*, 1919, lii, 61.

Borchgrevink's report is based on 87 cases of gastric or duodenal ulcer operated upon by Bull in either his hospital or his private practice. Seventy-eight of these were without acute complications. In 9 the complications were as follows: 5 cases, perforation of a gastric ulcer into the abdominal cavity; 3 cases, perforation of a duodenal ulcer into the abdominal cavity; and 1 case, loss of blood and severe anæmia.

In all of the 8 cases of perforation, the ulcer was on the anterior wall of the stomach or duodenum. This was not a chance occurrence but due to the fact that in this locality there is little opportunity for the formation of adhesions. Three of these 8 patients, who were operated upon, died. The operations were performed twenty-three hours, forty-nine hours, and five days after perforation, respectively. Generally those who recovered were operated upon within twenty-four hours. The fatal cases were all those of patients over 50 years of age.

In 7 of the 8 cases the perforation was closed by suture; in 9 the suturing was followed by gastro-enterostomy. Favorable immediate results were obtained in all. Of the 5 survivors, 3 had a gastro-enterostomy at the first operation; one showed new symptoms of ulcer two months later and was then treated by gastro-enterostomy; the other, who had a bilocular stomach, was subjected to a gastro-enterostomy six months after the first operation.

Excision of the ulcer was done only once, forty-nine hours after perforation. The patient died two days later. Four of those who survived were ultimately traced; none had symptoms of recurrence.

Most of the patients with uncomplicated cases of ulcer were men. As a general rule it is found that women are operated on for ulcer ten years earlier than men. In 78 primary laparotomies for uncomplicated ulcer there were 5 deaths; in 19 re-operations there were 2 deaths. Therefore, in 97 either primary or secondary operations there were 7 operative deaths (7.2 per cent). The causes of death were distributed as follows: peritonitis, 3;

embolism, 1; pulmonary complications, 1; circulus viciosus, 1; and hemorrhage, 1.

Sixty-five of the patients with uncomplicated ulcers were traced; 36 of these were free from symptoms, 23 had insignificant trouble, and 6 notable disturbances. Of all patients ultimately examined only 10 per cent showed bad results and when the operative mortality is taken into account the proportion of good to poor results is 82 : 18.

The author's findings were in general the findings after gastro-enterostomy as this was practically the only operative method used. For juxtapyloric ulcers and duodenal ulcers, which constituted the majority treated, the results have been very good and seem in every respect to equal those obtained by the more radical methods of recent years.

In the cases reported the majority of the juxtapyloric ulcers were associated with secondary stricture and dilation of the stomach, a circumstance over which gastro-enterostomy has particularly triumphed. The duodenal ulcers, on the other hand, were not as a rule accompanied by stricture and dilation and in this group the results surpassed those obtained in cases of juxtapyloric ulcers. It can be said, therefore, that gastro-enterostomy gives good results regardless of the location of the ulcer. It has an operative mortality less than that of resection and its end-results are equally good.

To what extent resection should have precedence over gastro-enterostomy in order to prevent the development of cancer is a question which must still remain unanswered. It is certain, however, that in many cases it has been found that cancer has developed in the stomach after resection for ulcer.

In the few cases of ulcer distant from the pylorus included in the author's statistics the results of gastro-enterostomy were far from equal to those obtained in the other two groups.

W. A. BRENNAN.

Walton, A. J.: The Treatment of Hour-Glass Stomach. *Surg., Gynec. & Obst.*, 1919, xxix, 213.

The author reviews the prevailing methods of treatment and comments upon them as follows:

1. Digital dilatation. Now abandoned.
2. Gastropasty—Allingham's and Kammerer's methods. The incision is largely through scar tissue, the ulcer is untouched, and no attempt is made to overcome pyloric stenosis.
3. Gastro-gastrostomy. The ulcer is not treated and pyloric stenosis is not overcome.
4. Single gastro-enterostomy. Merely palliative and rather difficult to perform.
5. Double gastro-enterostomy. Two anastomotic openings in same loop of intestine, one in each pouch. Difficult to perform. The large amount of bowel drawn through the mesocolon predisposes to later obstruction.
6. Partial gastrectomy. Unless there is evidence of malignancy this is a procedure of too great magnitude and difficulty for simple ulcer cases.

The author's method excises the ulcer area along

the lesser curvature in a V-shaped mass of varying size dependent upon the size, shape, and fibrous induration of the ulcer. The apex of the V is toward the greater curvature. The sides of the V are at least as long as the diameter of the stomach. The edges are approximated with chromic gut, the pylorus obstructed by a through and through mattress suture of silk, and a posterior gastro-enterostomy is done. This opening is made transversely with its midpoint opposite the line of excision of the ulcer

P. M. CHASE.

Finton, W. L., and Peet, M. M.: An Experimental Study of the Use of Detached Omental Grafts in Intestinal Surgery. *Surg., Gynec. & Obst.*, 1919, xxix, 281.

A general discussion of the literature on the use of detached omental grafts in intestinal work is followed by a detailed report of experiments on dogs which is illustrated by numerous photomicrographs.

The conclusions to be drawn from the results are that detached omental grafts are preferable to fixed grafts except in the presence of general infection and may be used on any abdominal organ. The indications are to replace lost portions of peritoneum, to strengthen suture lines, to prevent adhesions, to check hemorrhages, to occlude the pylorus, to cover the stump of the cystic duct or fallopian tube, and to re-inforce the peritoneum in threatened perforations.

The technique is simple and may be executed with little trauma and in a minimum period of time. Plain fine silk is to be preferred as suture material although No. 00 plain catgut is very good. The peritoneum need not be scarified. The raw edges of the graft must be turned in. Thin grafts survive best. The graft should be laid on smoothly and only a sufficient number of sutures should be used to keep it smooth and in place. Hemorrhage under a graft should not be allowed. In the absence of infection the thin graft survives at least six months practically unchanged.

P. M. CHASE.

Carr, W. L.: Hirschsprung's Disease. *Pennsylvania M. J.*, 1919, xxii, 705.

Carr enumerates the symptoms and pathology of idiopathic dilatation of the sigmoid colon (Hirschsprung's disease), and finds there is no reason for objecting to the theory that megacolon is due to a developmental cause. He reviews the embryological growth of the large intestine and states that any interruption in the growth of the small intestine may make proportional changes in the large bowel.

The condition is not entirely limited to the colon; there may be dilatation of the cæcum or rectum and, in rare cases, dilatation of the colon without involvement of the sigmoid.

In almost all cases the colon is elongated. In addition to the lengthening and distention, there is thickening of the intestinal wall, loss of elasticity due to proliferation of the connective tissue, and hypertrophy of the muscle layers.

The symptoms are constipation which in early infancy is indicated in the delayed passage of meconium and later is a manifestation of great importance. Meteorism, fecal impaction, pouching of the colonic walls, and pressure on adjacent organs are its sequelæ which cause most of the clinical symptoms.

In the present state of our knowledge and medical treatment, the prognosis in congenital cases is unfavorable as regards the duration of life. According to Neugebauer's statistics, 79 per cent of the patients died before their sixth year.

In the statistics of surgical treatment, colpepy in 8 cases gave no mortality, and 3 patients were reported cured by this method of lifting the sigmoid and fastening it so as to eliminate kinks. Resection in a one-stage operation cured 56.5 per cent, and, when performed in two stages cured 90 per cent.

Every patient with megacolon should be examined by a surgeon who should co-operate with the physician in charge.

H. A. MCKNIGHT.

Dragstedt, L. R., Dragstedt, C. A., McClintock, J. T., and Chase, C. S.: **Intestinal Obstruction. II. A Study of the Factors Involved in the Production and Absorption of Toxic Materials from the Intestines.** *J. Exper. M.*, 1919, xxx, 109.

Obstruction to the passage of food through the intestine leads to adverse symptoms and complete obstruction causes death. Acute obstruction in the upper part of the small intestine is more rapidly fatal than similar obstruction in the intestine lower down. The symptoms are those of a severe, rapidly developing toxæmia. Toxic substances accumulate in the obstructed intestine which, when injected intravenously in animals or absorbed from the abdominal cavity, produce symptoms similar to those arising after acute obstruction.

It has been shown by Stone, Bernheim, and Whipple, and later by Hartwell and his associates and Murphy and Brooks that the production of isolated closed loops of the intestine with the re-establishment of intestinal continuity around the isolated loop, produces symptoms similar to those following complete obstruction of the intestine at the same level. There is an accumulation of toxic materials in these intestinal loops similar to those in the obstructed intestine. In a previous study it was demonstrated that these toxic substances can be formed in such isolated closed intestinal loops, with resultant toxæmia, after all food materials and digestive secretions have been previously removed by careful washing with water or salt solution. It was shown also that the secretions of the intestinal mucosa are not toxic and do not give rise to the symptoms of acute obstruction when absorbed directly from the abdominal cavity.

However, the presence of bacteria plus a suitable substrate either in the lumen of the obstructed intestine or in closed intestinal loops does not in many cases produce the characteristic acute toxæmia unless there is some factor present permitting the absorption of these toxic materials into the general

circulation. Absorption of toxic materials from the intestine occurs in clinical and experimental obstruction and in the great majority of cases after the formation of closed isolated loops. The study reported was undertaken to determine the factors involved in this absorption of toxic materials and to secure additional evidence as to the manner of their production.

The experiments were performed on dogs under complete etheranæsthesia and with strict precautions for asepsis.

It has been definitely determined that death resulting from acute obstruction of the intestine is due to a toxæmia and that the responsible toxic substances are formed in the obstructed intestine. These toxic substances may be formed even if all food materials, end-products of digestion, and the secretions of the stomach, liver, and pancreas have been carefully excluded. The secretion of the intestinal mucosa is not toxic either when absorbed from the abdominal cavity or injected intravenously. The mucosa of the alimentary tract (stomach, duodenum, jejunum, ileum, or colon) does not elaborate an internal secretion which is necessary to life or which could be disturbed by the conditions of acute obstruction so as to account for the syndrome of that condition.

The presence of bacteria in the lumen of the intestine is necessary for the production of the characteristic toxic substances and in their absence these substances do not form. They are produced by the action of the intestinal bacteria on proteins or their split products. In the absence of food, gastric juice, bile, or pancreatic juice, these bacteria can produce the characteristic toxic substances from the intestinal juice or from the proteins of desquamated mucosa cells. The important poisons will not provoke the appearance of immune bodies when injected in experimental animals and it was not possible to demonstrate that an animal can become immune to the toxæmia of acute obstruction. Toxic amines are produced by the action of various intestinal bacteria on amino acids, and the evidence more and more points to these substances as the important agents in the toxæmia of acute intestinal obstruction.

The toxic substances arising in the lumen of the obstructed intestine are not readily absorbed through a normal mucosa, a point emphasized by Hartwell and his associates and by Murphy and Brooks. Nor are they absorbed to any great extent through the mucosa of a closed intestinal loop until this mucosa has been injured by the distention of the loop and the consequent interference with its blood supply. If this distention is prevented by any means, absorption of poisons in quantities greater than can be cared for by the liver and other tissues does not occur.

Thus it appears that the injury to the mucosa cells, either as a result of the sudden distention brought about by conditions of obstruction or by any other factors which interfere with the blood

supply to the mucosa (strangulation, etc.), is an important factor in the absorption of toxic substances from the intestine. There can be no doubt that necrosis of the mucosa greatly facilitates the absorption of intestinal poisons, but it is incorrect to say that intestinal poisons, i.e., those found in obstruction, cannot be absorbed through a normal mucosa.

The protective action of the intestinal mucosa exercised through its properties of selective absorption is not absolute, but that it is of great significance is shown by the fact that an animal can take care of the amount of poisons absorbed through the normal mucosa of a short closed intestinal loop which has been treated with astringents, but that as soon as this mucosa becomes necrotic an overwhelming amount of toxic materials gains entrance to the blood stream and toxæmia and death occur. The absorption in these cases cannot be different from absorption from the peritoneal cavity.

From the above facts the following conclusions were drawn:

1. It is impossible to sterilize the intestine by the use of chemical antiseptics even when these are applied directly to the mucosa of isolated segments.
2. The mucosa of the alimentary tract does not elaborate an internal secretion which is necessary to life, or a secretion which could be distributed by the conditions of acute obstruction so as to account for the syndrome of that condition.
3. The substances responsible for the toxæmia in acute obstruction are produced by the action of intestinal bacteria on proteins or upon their split products.
4. An injury to the intestinal mucosa, particularly that resulting from disturbances of the blood supply to the intestine, greatly facilitates the absorption of such poisons. The work of Hartwell and his associates and that of Murphy and Brooks on this point are confirmed.

G. E. BEILBY.

Jalaguier: Indications for the Surgical Treatment of Acute Appendicitis (Indications du traitement chirurgical de l'appendicite aiguë). *Bull. Acad. de méd.*, Par., 1919, lxxxii, 65.

Jalaguier's paper is a criticism of Ténon's recent article advocating operation especially in the early stages of appendicitis.

Jalaguier, with an experience of thirty years, has always been a resolute adversary of the doctrine of systematic intervention, a doctrine which reduces all indications to a single mathematical formula, i.e., diagnosis of appendicitis=operation. This doctrine is dangerous because it is not necessarily true that if the diagnosis is correct and the operation is properly performed death will not result.

Appendicitis is not always typical. It varies as to its origin and also as to its virulence.

Jalaguier is not an abstentionist as regards operation. He is an opportunist. By detailed clinical study he seeks the operative indications in each individual case. He believes that a case of appendicitis observed from the beginning, treated and

directed by an experienced surgeon, may be kept under such observation without danger. Signs and symptoms by which the advisability of operation may be judged are always present.

The principal phenomena which develop within from six to twenty-four hours after the onset of an acute appendicitis and indicate operation are as follows: ice applied to the abdomen does not give relief, the facial expression does not change or changes for the worse, vomiting persists or reappears after a remission, the temperature rises and there is a disturbance in the normal relationship between the temperature and the pulse, the local pain becomes increased, and the abdominal wall remains retracted and wooden or shows a tendency to become swollen. Any of these symptoms is an indication for operation, and if several are observed the indication is stronger.

Although the author has no general statistical figures to submit, he states that his operative mortality in acute cases has been only 3 or 4 per cent.

Very frequently if the appendicular and intestinal phenomena are properly treated they will evolve favorably and the appendix can be removed in the "cold" period under infinitely better conditions than if the operation is carried out during full infection. However, when the symptoms and signs mentioned are noted, operation should not be delayed.

Abstention from operation necessitates hospital supervision of the patient by the surgeon himself assisted by capable help who will rigorously carry out the treatment and constantly watch developments. Otherwise it is best to operate at once as Ténon urges.

Summing up his views, Jalaguier states that in appendicitis as in all diseases amenable to surgical treatment we should begin by studying the patient in order to arrive at a correct diagnosis and operate only on the basis of definite knowledge. By so doing there is no loss of valuable time and the patient's recovery is not prejudiced. Hasty operations and diagnostic errors are avoided.

Jalaguier believes that systematic operation leads to the error of operating upon cases of cholecystitis, intermittent hydronephrosis, and other conditions as cases of appendicitis. The differential diagnosis is not always easy.

In discussing one type of appendicitis Jalaguier differs from Ténon definitely as regards operation. This is the acute type which, having evolved for a time, has given rise to an indurated mass with relatively recent adhesions to the wall, the iliac fossa, and the liver. In such instances operation in the early stages is always extremely difficult and it is hard to find and dissect the appendix from the surrounding mass. Under proper treatment the exudates may be resorbed and a prudent drainage operation will often suffice, making it possible to delay the removal of the appendix until some months later when conditions are more favorable.

W. A. BRENNAN.

LaRoque, G. P.: Appendicitis with Abscess and Diffuse Peritonitis; Results of Operations in 101 Cases. *Mississippi Valley M. J.*, 1919, xxvi, 224.

It is the duty of all surgeons to report their personal results and to invite comparison with the results of other surgeons in the community.

The first question to decide after a diagnosis of appendicitis is made is whether or not the patient should be operated upon immediately. This question must be answered on the basis of the conditions of the individual case.

The second question is whether or not the patient should be sent to the nearest hospital or to a hospital at a distance where there may be a better surgeon. This can be answered only by making a comparison of results.

Of the 600 patients with appendicitis operated upon by the author, 101 (16 per cent) had abscesses; in 25 the abscess had ruptured and caused diffuse peritonitis. All of these patients with abscesses had been sick for more than forty-eight hours, some for two weeks, some for three weeks, and one, who had been treated for typhoid fever, for a period of four weeks. All of them had been given some sort of cathartic during the acute attack.

In 100 other cases of acute appendicitis in which neither cathartics nor food had been given and morphine had been prescribed to quiet peristalsis, not one case required drainage. These patients were not operated upon immediately, but were taken some distance before operation. It is generally agreed that under the treatment they received immediate surgical intervention is unnecessary. In the cases of 40 per cent of these patients, traveling in various conveyances for some distance for operation did not affect their condition, and the rest seemed to be beneficial. Emergency work by an inferior surgeon should give place to treatment by a skilled surgeon unless the former can demonstrate an operative mortality of less than 3 per cent.

A simple appendectomy should not be performed before time is taken to make a thorough diagnosis, since some other condition may be present. This is especially true in women in whom pelvic troubles are not infrequent. In 5 per cent of the author's 500 pelvic cases there had been a previous operation for appendicitis. In these cases he has waited for weeks that he might make a correct diagnosis, and at operation has used an incision which was adequate for the pathology present. Ninety-seven per cent of the author's abscess cases are cured as a result of this method.

Removal of the appendix at the time that an abscess is drained would seem to be the ideal procedure but must be decided upon in the individual case on the basis of the risk to the patient's life in searching for a hidden appendix. The author removed the appendix in 94 of his 101 cases, and is anxious to obtain the statistics of other surgeons who do not remove the appendix in cases of abscess.

Removal of the appendix at the time of drainage saves life, decreases the length of time required for the healing of the sinus, and obviates the necessity for a second operation for recurrent illness.

Of the three patients who died in the author's series of 101 cases, one had a large hole with diffuse peritonitis seven days after the operation, and two were boys who were almost moribund with cathartic peritonitis at the time of operation. Those who were cured remained in bed for from twelve to eighteen days. Two men had femoral phlebitis in the right thigh. No wound infection nor hæmatoma occurred. One woman with associated pelvic disease had an annoying sinus of the abdominal wall. In three instances a fecal fistula followed the operation. One of these occurred in a boy and healed in three weeks. The other two patients had intestinal tuberculosis. Four dilatations of the stomach were promptly relieved by lavage. Two infants with acidosis and in stupor were relieved by rectal injections of soda water.

No respiratory diseases developed after operation, and there was no postoperative obstruction, hæmorrhage, secondary peritonitis, abscess, anæsthetic disaster, or catastrophe. A postoperative hernia developed in only one case, and the author concludes that this complication is rare. **M. H. HOBART.**

Back, I.: Carcinoma of the Rectum: Choice of Operation. *Lancet*, 1919, cxcvii, 421.

The author's percentage of operable cases is exceedingly low, slightly under 30 per cent; 40 of 100 are operable in the female, while only 20 of 100 are operable in the male.

In considering the early stages of the disease the author states that carcinoma of the rectum starts as a small ulcer or polypoid growth. The lack of attention given this condition seems to be due to absence of symptoms rather than procrastination.

Examination of the rectum under ether is advised, with the view of ascertaining the following facts: (1) the extent of the growth in both directions; (2) the nature of the growth; (3) the mobility of the growth; and (4) the enlargement of the lumbar glands and the liver.

If the growth appears inoperable an immediate colostomy is advised for the following reasons: (1) the patient will become weaker as time goes on; (2) if the surgeon awaits obstruction the bowel will be somewhat dilated and hypertrophied and this will cause technical difficulties; (3) the deflection of intestinal contents from a growth will tend to retard its progress; and (4) it will relieve intestinal stasis.

Hypogastric colostomy is preferred because of the ease with which it may be cared for by the patient and the fact that the rectus abdominis often develops the power of a sphincter.

Emphasis is placed upon the importance of combating the idea that a colostomy is intolerable.

The contra-indications to radical operation are: (1) general—age, metastasis, and cachexia; and (2) local—the extent of the growth and its fixation.

The author is convinced that any operation which is intended to leave a normal anus (that is, an operation which does not end with a colostomy) is a poor operation. Under this head he includes: (1) the transsacral excision of the growth, with end-to-end anastomosis, which often leads to recurrence and stricture; (2) abdomino-anal operations which are frequently followed by stricture and difficulty in defecation; and (3) the Kraske operation.

As satisfactory radical operations he considers: (1) a combined abdominoperineal operation, and (2) a colostomy with later a high perineal excision.

In brief, the first operation consists of making a permanent colostomy with the upper end of the divided sigmoid or descending colon and reconstructing the pelvic peritoneum over the lower portion of the divided bowel. This is then removed by the posterior route. The second operation consists of a primary hypogastric colostomy followed in a fortnight by posterior excision of the rectum and sigmoid above the growth, the bowel being completely surrounded with peritoneum. The severed end of bowel is closed and allowed to drop back into the peritoneal cavity.

The abdominoperineal operation is the more radical and has the higher mortality. The author prefers the colostomy followed by high perineal excision, a two-stage procedure. This operation offers the patient as good a chance with less risk than any other.

The common causes of death are: (1) shock; (2) peritonitis; and (3) intestinal obstruction.

The conclusions drawn are as follows:

1. Only 30 per cent of cases of carcinoma of the rectum admit radical operation when first seen.
2. When radical operation is impossible a hypogastric colostomy should be done at once.
3. Radical operations which are intended to retain the anal canal are pathologically unsound.
4. There are only two sound radical operations: (1) colostomy followed later by intraperitoneal excision by the perineal route, and (2) an abdominoperineal operation.
5. Of these, the former is better except when the growth is at the rectosigmoid juncture.

J. A. H. MAGOUN.

LIVER, PANCREAS, AND SPLEEN

Lyon, B. B. V.: *Diagnosis and Treatment of Diseases of the Gall-Bladder and Biliary Ducts: Preliminary Report on a New Method.* *J. Am. M. Ass.*, 1919, lxxiii, 980.

Following the suggestion of Meltzer regarding the use of magnesium sulphate solution deposited in the duodenum to relax the common-duct sphincter, the author made about one thousand observations in over one hundred cases to determine its value as a diagnostic and therapeutic measure.

After rinsing the mouth with permanganate and zinc chloride solution, the duodenal tube is passed in the usual way. It reaches the duodenum in from

fifteen to forty-five minutes, a fact which is determined by the duodenal tug, the character of the aspirated fluid, and the failure to recover immediately by vacuum aspiration the material swallowed. When once the tube is in the duodenum, one barrellful of air from a 30 cubic centimeter syringe is introduced to balloon the duodenum in order to prevent traumatism to its mucosa.

The first, or duodenal, aspiration should be bile-free, pearly gray, of syrupy consistency, fairly transparent, and with a small amount of flaky sediment. The presence of bile during starvation means a lesion of the organs related to this intestinal zone.

From 50 to 100 cubic centimeters of sterile 25 per cent saturated solution of magnesium sulphate are then introduced and aspiration in a second sterile bottle is begun. In from two to ten minutes the aspirated material is stained a light yellow.

In from one to three minutes a sudden transition occurs. The bile becomes darker and more viscid, but remains transparent. This is gall-bladder bile.

When the gall-bladder bile is replaced by a lighter yellow, thinner, and usually*transparent bile of intermittent flow, a fresh liver supply is being obtained.

Pathologic states of the biliary tract alter the appearance and character of the bile from the different regions, and in the various aspirated fluids the author has noticed the evidence of exudate.

In one case three small faceted stones and a gritty sand-like bile were aspirated. Subsequent operation revealed a walnut-sized calculus in the common duct and several small stones in the gall-bladder.

The method described may be of value in effecting drainage. The author believes that nine cases of catarrhal jaundice were shortened from an average duration of thirty-five days to seventeen days.

It should be emphasized that to effect relaxation of the common-duct sphincter the solution used must be deposited directly within the duodenum.

The article is a brief and preliminary report to be followed by further details of the author's experience with magnesium sulphate and other solutions.

K. L. VEEH.

MISCELLANEOUS

Dandy, W. E.: *Pneumoperitoneum.* *Ann. Surg.*, 1919, lxx, 378.

The author presents an additional method by which a diagnosis of perforation of the alimentary canal may be made.

A detailed report is given of the case of a patient with typhoid who was believed to have a perforation of the intestine. Before opening the abdomen an X-ray was taken of the chest to exclude tuberculosis. The plate revealed gas between the liver and diaphragm, thus clinching the diagnosis of perforation which was found at operation.

The location of the gas will depend on: (1) the position of the body, and (2) the amount of gas. It

is possible to determine only that a perforation is present; it is not possible to determine the origin of the gas in the abdomen. The examination is of value chiefly when perforation develops insidiously and in cases of trauma in which other conditions mask those of perforation.

The author reports experiments (illustrated by plates) in which air was artificially introduced into the abdominal cavities of several dogs. The resulting pictures give a remarkably sharp definition of the abdominal contents.

The conclusions drawn are:

1. Perforation of the intestines or the stomach can be diagnosed by the X-ray findings—pneumoperitoneum.

2. The escaping intestinal gases accumulate under the diaphragm if the head is elevated. The roentgenogram shows the diaphragm and liver sharply outlined and a collection of air separating them.

3. Localized collections of gas in the abdominal walls, the buttocks, etc., may betray a colon infection and therefore an abscess resulting from a perforated bowel.

4. An artificial pneumoperitoneum may be produced by injecting air into the peritoneal cavity.

5. In the production of pneumoperitoneum air is superior to other gases because it can be obtained so readily and it is not necessary to sterilize it.

6. Nearly all the abdominal organs can be sharply defined in the roentgenogram after the introduction of air into the peritoneum. Even the intestinal walls are sharply outlined.

7. As it makes it possible to determine the size, shape, and position of the abdominal organs, induced pneumoperitoneum should prove to be of great value in the localization and diagnosis of intra-abdominal lesions.

P. M. CHASE.

Rosenblatt, J.: Pneumoperitoneum. *N. York M. J.*, 1919, cx, 501.

A case of accidental pneumoperitoneum is reported in full and comments are made on the X-ray study of the condition.

During an attempted pneumothorax for tuberculosis, air was introduced into the abdominal cavity instead of the pleural cavity. This was discovered at the X-ray study of the chest. Numerous plates were taken until the air was absorbed. At no time did the patient show signs of abdominal distress or symptoms. An excellent opportunity was afforded for the study of intra-abdominal pressure.

The following observations were made:

1. When the patient was in the right lateral posture and the needle was introduced just below the left side of the diaphragm, the initial manometric readings before any air was introduced were -3 centimeters of water on expiration and -2 centimeters on inspiration. After 500 cubic centimeters of air were introduced, the readings were -2 on expiration and 0 on inspiration.

2. Three days later with the patient in the same position and the needle introduced in the same area, the initial manometric readings were -2 on expiration and -1 on inspiration. After 1,000 cubic centimeters of air were introduced, the pressure rose to $+1$ on expiration and $+2$ on inspiration.

3. When the same procedure was repeated about one week later, the initial readings were again -2 on expiration and -1 on inspiration.

From the roentgenological point of view it was demonstrated that the definition of the abdominal contents is much clearer and sharper than when there is no air in the peritoneal cavity.

P. M. CHASE.

SURGERY OF THE EXTREMITIES

DISEASES OF BONES, JOINTS, MUSCLES, TENDONS. GENERAL CONDITIONS COMMONLY FOUND IN THE EXTREMITIES

Knerr, E. B.: Osteosarcoma — Roentgen Ray Treatment—A Case Report. *J. Missouri M. Ass.*, 1919, xvi, 251.

The salient point in the roentgen-ray diagnosis of malignant from non-malignant bone tumors is that the former invade the surrounding tissues and destroy their identity while the latter are limited beyond the new bone deposits by a clearly defined border. The limited tumor is non-invading, does not destroy, and may be excised with impunity.

Hitherto the pathologist has been relied upon to determine the diagnosis from microscopic sections of excised portions. Such excisions, however, are known to be highly provocative of metastases and are condemned if the diagnosis can be made by other means.

The case report is that of a sarcoma of the tibia in a girl of 13 which somewhat resembled osteomyelitis but was differentiated by areas of bulging and especially by "rays" of new bone shooting out from the margin and perpendicular to the shaft. Marked improvement under roentgen-ray therapy has continued for more than a year.

D. R. BOWEN.

Grant, J. W. G.: Progressive Myositis Ossificans. *Brit. J. Surg.*, 1919, vii, 138.

The author reports a case of progressive myositis ossificans in a girl, aged 4 years, whose complaint was pain and stiffness in the back and shoulders. A radiograph showed large irregular plates of bone in the erector spinæ, latissimus dorsi, pectoralis major, and teres major muscles. The arms were fixed in 15 to 20 degrees adduction and the scapulæ fixed to the chest wall.

While surgery gives good results in traumatic myositis ossificans, in the progressive form the re-

formation of bone makes the prognosis unfavorable. The author operated and gained abduction to 45 degrees but within a few months the bone plate had re-formed.

H. W. MEYERDING.

McWilliams, C. A., and Hetzel, W. B.: Report of 82 Cases of Knee-Joint War Injuries. *Ann. Surg.*, 1919, lxx, 257.

The authors tabulate the results obtained by them in 82 cases of knee-joint war injuries from Evacuation Hospital No. 1 with remarks on the Willems treatment by immediate closure and subsequent mobilization and comments on the surprisingly good functional results obtained by Willems. In comparison, the results obtained in the A. E. F. by the use of the old-time immobilization method, even though somewhat modified by the direction of earlier motions, suffer markedly, particularly in the septic cases. The causes of these results were three: incomplete knowledge of Willems' treatment, an insufficient nursing staff, and too early evacuation of the patients.

Of 73 cases operated upon in Evacuation Hospital No. 1 for knee-joint injuries, 57 (78 per cent) remained clean. These cases were not treated exactly as Willems directs because of different methods used in the American Army, and the authors believe that better results would have been obtained if the technique advocated had been employed.

Drainage followed by immediate mobilization is much better than any other method as no stagnant pools of pus are left. If the motion is frequent and sufficiently vigorous, the pus is expelled as it forms. The mobilization is intended as much to afford adequate drainage as to preserve the joint movements. Adequate drainage is necessary to confine the infection to the synovial membrane and to prevent its spread to the cartilage and bone.

In septic cases there are three chief indications: first, adequate incisions for efficient drainage; second, active motions to be begun immediately after operation and continued unceasingly; and third, the patient should not be evacuated to another hospital within ten days of the operation.

The operative technique consists in a careful excision of all traumatized and infected soft tissues, removal of the foreign body, removal of the contused edges of the capsule and synovial wound, irrigation of the joint with Dakin's solution followed by ether, and complete closure of the capsular rent.

Just as soon as the patient recovers from the effects of the anesthetic, he is made to move the articulation actively in bed. Passive motions are painful, set up inflammatory reaction, and subsequently may cause the rupture of an extra-articular abscess into the joint. The sooner active motions are begun after the operation the less the pain because the peri-articular structures do not have time to become infiltrated with exudate. On the second or third day the patient is made to get out of bed and take a few steps without crutches.

When frank pus is evident, either from signs of

inflammation or bacteriological examination, thorough drainage must be established, the joint washed out with Dakin's solution, and active motion begun at once. Walking is important because the muscular contractions compress the joint and cause a marked increase in the expulsion of pus. The patient is made to walk the day after the operation without crutches. It is very important that a sufficient number of drainage openings be made to allow for the adequate escape of the pus.

Patients treated by this method never have any serious change in their general condition, even during the early febrile period, and they do not fear movement as do those whose joints are immobilized.

H. A. MCKNIGHT.

Alexander, C. B.: The Pathology and Treatment of Stiff Knee in Relation to Compound Fracture of the Femur. *Brit. M. J.*, 1919, ii, 339.

Stiffness of the knee following compound fracture may be due to articular, peri-articular, or muscular conditions. The author deals chiefly with the changes in the quadriceps, calling attention to the pathologic changes taking place in this muscle in compound fracture with sepsis, i.e., sinus formation, loss of function, and a fibrosis which causes shortening and loss of contractility and extensibility. Not only is the muscle substance shortened and replaced by scar, but changes in the lymph in the capillaries surrounding the individual muscle fibers aid in the prevention of normal function.

In the treatment, perimascular, peri-articular, and intramuscular adhesions and contracted and imperfectly functioning muscle cells are to be dealt with. The principle cause of loss of motion, however, is to be found in the quadriceps. The author advises: (1) prophylactic measures such as chemical sterilization, removal of all sequestra, and, when possible, early secondary closure of wounds; (2) the destruction of scar tissue binding the muscle to the bone and of all intramuscular and peri-articular adhesions; and (3) the restoration of normal functions of contractility and extensibility and stimulation of the growth of young muscle cells.

The Bristow faradic coil loosens intramuscular and peri-articular adhesions and improves muscle tone. If the fracture is united and the patient out of a Thomas splint, a small sand-bag may be placed beneath the knee as he lies in bed with the heel off the bed. The weight of the leg is then sufficient to begin flexion. Following this, the knee should be further flexed under gas in order that the remaining intramuscular and peri-articular adhesions may be broken down. Massage and graduated contraction should then be continued for three days or until effusion has ceased, when passive motion should be begun. When the patient is able to bear his weight and the fracture is firmly united, knee-bending exercises are advised and passive motion while he is lying face downward on a table.

W. G. MEYERDING.

Chutro, P.: Infected Wounds of the Ankle. *J. Orthop. Surg.*, 1919, i, 521.

Discarding the Willems' treatment for lesions of the ankle when the arthritis is accompanied by a fracture, Chutro advocates the operation of astraglectomy in war fractures of the astragalus because of the existing deformity which disables the joint movement and the retention of pus due to the partitioning of the synovia.

Failure to secure suitable drainage following this operation, however, has occurred often, and with it there have been other unfavorable phenomena, such as chronic edema with immobile and contracted toes, exuberant bleeding granulations, and complete disability. The plausible explanation is poor immobilization of the foot after the operation. The foot is at a right angle but it was dislocated forward instead of backward and this brought about disappearance of the retromalleolar space allowing approximation of the tendo achillis to the bones of the leg, a doriflexion contracture of the toes, a plantar flexion of the forefoot with a consequent and later equinus, a circulatory embarrassment of the nerves and vessels due to the disappearance of the retromalleolar space, and a change in the position of the foot allowing the os calcis to fall from an elevation of about 17 degrees down to the horizontal. Such lesions may be aggravated by lateral displacements. The deformity may become fixed and very difficult to correct. Often amputation is indicated.

To obviate these end-results, Chutro describes how he fixes the foot with bronze wire. The incision is begun above the external malleolus, brought down along the anterior aspect to the line of the joint, then made transverse to the prominent tibialis tendon, and finally brought down 2 or 3 centimeters. The wounds of entrance and exit are thoroughly cleaned out, the astragalus is removed, and the foot is fixed as follows: a bronze wire is passed through the skin and soft parts of the inferior lip of the wound near the superior posterior margin of the cuboid and then passed back across the anterior border of the malleolus to produce a backward dislocation of the foot.

The advantages of this fixation are that the cuboid is brought close to the external malleolus, the tarsus is projected backward, the anterior portion of the os calcis is kept above the horizontal plane, and the retromalleolar spaces are deepened. In this manner the tendo achillis is kept taut and does not compress the vessels.

The foot is immobilized completely at a right angle, the dressings are renewed at long intervals, and the bronze wire is removed about the fifth week. Walking may be begun about the fourth or fifth week.

R. G. PACKARD.

Epstein, S.: On Focal Infection as a Cause of Painful Heel. *Med. Rec.*, 1919, xcvi, 187.

The author discusses three types of cases of painful heel, those due secondarily to tonsillar infection, oral infection, and gonorrhœa.

A young man, aged 23, with negative venereal history, developed sudden severe pain, redness, and swelling of the right ankle and heel following an attack of tonsillitis four days before. A week later the left heel became tender and painful, and the excruciating tenderness of both heels prevented walking for eleven months. The feet were manipulated twice under anæsthesia but this and the wearing of arches afforded no relief.

The author found marked tenderness along the inferior and outer surfaces of the os calcis which on X-ray examination proved to be due to marked thickening of the periosteum, especially along the under surface. This thickened periosteum was curetted through a mid-heel incision and sixteen days later the patient went to work free from all pain. In another case, tonsillectomy was followed by a very rapid and permanent cure.

As the tonsil is a clearing house for mouth infections and tonsillar attacks are often due to dental infections, arthritic conditions are not benefited until all foci are eradicated. Results after teeth extraction are more striking than those following root amputation. In chronic cases with bony deposits about the joints improvement is slow. Results are very striking in young subjects, especially when the symptoms are polyarticular or muscular.

The third case reported was that of a physician, 49 years old, who was ill in bed for ten weeks with osteo-arthritis of both metatarsophalangeal joints of the great toe following an attack of grippe with tonsillitis. The pain was excruciating and his temperature reached 102 degrees. Following the extraction of an infected last molar tooth and the application of plaster casts to the feet relief from pain followed quickly. The patient resumed active practice in three months.

The gonorrhœal heel was found to occur in patients under 40 years of age. In this condition the X-ray is indispensable. The spur is really a hypertrophic periostitis. The heels should be curetted only when an extremely tender point or an exostosis is demonstrable. J. J. KURLANDER.

FRACTURES AND DISLOCATIONS

Speed, K.: Elementary and Applied Physics of Bone. *Surg. Clin. Chicago*, 1919, iii, 1007.

A physical analysis of fractures leads to a better understanding of their pathology and to better treatment. Bone is not inert and rigid but a tough, elastic, living, and growing tissue. The physical laws of stress and strain must be applied to it.

The calcaneum crushes or cracks only under great force. A study of its architecture reveals an extremely thin shell of compact tissue and two truss systems in the cancellous bone. The system resisting compression force converges toward the center of the bone, while that resisting the plantar and calf pull arches in the long axis of the bone. It is the spongy bone that resists applied forces.

Sixty per cent of the total weight of adult bone

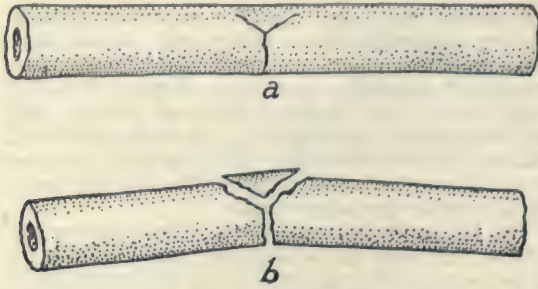


Fig. 1. An example of compression force applied to a long bone. The plane of separation starts at *a* and the bone yields first from the tensile force opposite the point of compression, giving a more or less transverse fracture with breaking-out of the fragments.

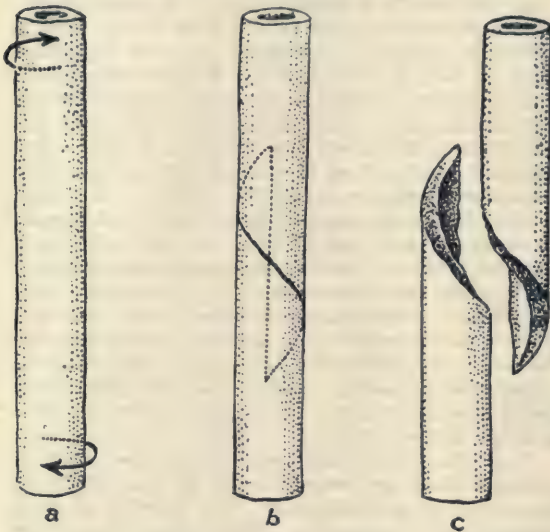


Fig. 2. *a*, A bony cylinder subjected to torsional violence. The lower end represents the foot portion twisted outward in the direction of the arrow, as in an outward slipping of the foot. The upper arrow indicates the restraining force and fixed knee. *b*, The tendency of tubular bone to unroll in response to torsional violence. The two points of beginning separation usually lie on the same surface, one directly above the other and connected by a plane of spiral separation of varying angles. *c*, Complete separation of bone tubular shaft which occurs experimentally when torsional violence is applied.

is due to calcium phosphate, carbonate, and fluoride with some magnesium phosphate. It is these salts that make the hardness and rigidity of bone. In health, calcium equilibrium is maintained in the bones. This is disturbed by disease and trauma. Information regarding the relative salt content may be obtained by roentgen-ray study.

Wolff's law is as follows: "The structure of bone is determined by the internal reaction of the indivi-

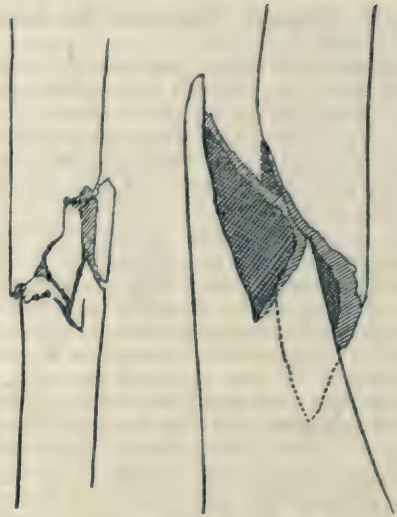


Fig. 3. Left: An example of an oblique fracture from a slow moving force with the broken-out fragment on the side of the shaft exposed to the tensile force which tears apart the bone fragments. Right: Tracing of a spiral fracture of the femur illustrating the mechanism of spiral separation. Note how nearly it conforms to the diagrammatic figures.

dual bone to the body weight and to the stress and strain of muscular activity." Thus we see a large firm mass of involucrum about a weaker sequestrum; attempts to straighten angular deformities in shaft fractures by building in the concavity and removing the convexity; and the atrophy of disuse.

Forces transmitted or applied to bones are compressive or tensile, with the elements of torsion, flexion, and shearing force added. The analysis of an acting force is not always simple because the real factor in the break may be secondary vibrations of rapidly alternating forces.

The principal forces which fracture long bones are either compression or torsion strains.

A force acting against the axis of a long bone produces a corresponding point of maximum tensile force on the shaft opposite its point of action.

From a lesser degree of the latter force there are multiple fracture planes which result in a tearing-out of fragments.

A compression force rarely acts with sufficient strength and rapidity to shear the bone transversely. Moreover, it rarely acts at a right angle to the axis of the bone. As usually one of the fissures due to the tensile force becomes the main plane of separation, a true oblique fracture results.

Torsion fractures are not true oblique fractures because the fracture line is spiral and the sharp points of the fragments are on the same surface of the bone while in oblique fractures they are on opposite sides.

Torsion forces cause a separation in a direction opposite the applied force and tending toward a longitudinal unrolling. However, as no force acts alone, flexion enters as a factor here to contribute a longitudinal plane of fracture between the initial points of separation.

Torsion fractures of the leg are usually due to violent twisting of the foot outward with the trunk the fixed portion, but the foot may be fixed and the force come through the trunk. K. L. VEHE.

Thomas, T. T.: The Correction of Deformity in Fractures with a New Conception of the Mechanism of Fractures of the Upper Extremity. *Ann. Surg.*, 1919, lxx, 359.

The author discusses the mechanism producing deformities in fractures, especially those of the upper extremities, from the viewpoint of the force causing the fracture rather than the pull of the muscles following the fracture.

After a general discussion the conclusions drawn are as follows:

1. The X-ray is not being used sufficiently frequently to determine the results of efforts at reduction of fracture deformity.

2. Sufficient use of it for this purpose would probably demonstrate the fact that reduction of the overlapping of fragments in fractures of the shafts of the long bones without operation is rarely accomplished. The contraction of the surrounding muscles caused by the irritation of the fragments never relaxes until the muscle is permanently shortened by organization of the traumatic exudate which always infiltrates these muscles about the fracture. Probably no known method of extension can effectively overcome this contraction.

3. Most fractures and dislocations of the upper extremity are probably due to falls on the hand. A dislocation is merely a fracture of the skeleton at a joint with displacement of the fragments.

4. In a fall the upper extremity is interposed, palm down and elbow rigidly extended, to break the force of the fall; therefore, the mechanism by which the force is applied to it is essentially the same in all falls.

5. The common and typical displacement in fractures and dislocations of the upper extremity can be more effectively explained by a fracturing force such as that described rather than by the theory of the pull of certain special muscles. Thus the upward and backward displacement of the lower fragment in a Colles fracture, now universally admitted to be due to a fall on the hand, is essentially the same as that found in the common posterior dislocation of the elbow and supracondylar fracture of the humerus. There is as much evidence for ascribing these to a fall on the hands as the Colles fracture.

6. The typical displacement in fracture of the surgical neck of the humerus, dislocations of the shoulder and acromioclavicular joints, and fracture of the clavicle (when the humerus is placed in the

same plane as the clavicle), is a downward, inward, and forward displacement of the outer fragment and an upward displacement of the inner fragment. If hyperabduction at the shoulder is admitted to be the cause of the shoulder dislocation, why should it not be held responsible for the other three breaks in the skeleton in this region? The hyperabduction is due most frequently to falls on the hand, so that here as elsewhere in the upper extremity, the great underlying cause of fractures and dislocation is a fall on the hand. P. M. CHASE.

Jean, G.: Carpal Dislocations (*Les dislocations du carpe*). *Arch. de méd. et pharm. nav.*, 1919, cviii, 24.

Dislocation of a carpal is rare. The usual cause is a fall upon the hand when it is in extension. The type most frequently observed is fracture of the scaphoid with luxation of the os magnum behind and of the semilunar in front. There is but a fragile capsule uniting these two bones and if the traumatism continues to increase the extension, the head of the os magnum is easily pushed behind the semilunar and a backward luxation results. With a little more pressure the head of the os magnum acts as a lever, enucleates the semilunar from its place in the first range, and pushes it forward. A fracture of the scaphoid almost always accompanies these luxations. The wrist region is diffusely swollen and the fingers semiflexed. The edema is seen to be antero-posterior and on palpation the carpal bed is found filled by a hard, painful mass, the semilunar. The head of the os magnum sometimes makes a salient in the vicinity of the extensor tendon of the medius and above the empty bed of the displaced semilunar. Diagnosis can usually be verified by radiographs.

The prognosis is serious if the injury is not properly and promptly treated. Severe articular lesions, painful ankylosis of the wrist, and permanent flexion of the fingers may result. The treatment is reduction under an anæsthetic. If this is not practicable the semilunar must be extirpated. An incision is made along the internal edge of the tendon of the great palmar. After section of the interior annular ligament and displacement of the flexor tendons the semilunar may be freed and extirpated. If the upper fragment of the scaphoid is adherent to the semilunar, it also should be removed. The use of a plaster cast is not advisable; from the first day after operation active movements of the wrist and fingers should be instituted.

The author gives short histories of three cases, two of frontward semilunar luxation, backward luxation of the os magnum and fracture of the scaphoid, and one case of semilunar and radial luxation with fracture of the neck of the scaphoid.

W. A. BRENNAN.

Peet, M. M.: Fracture of the Acetabulum with Intrapelvic Displacement of the Femoral Head. *Ann. Surg.*, 1919, lxx, 296.

Peet gives a brief résumé of the literature of this rare condition, following it with a report of a case of

his own and a discussion of the mechanism of acetabular fracture, its signs and symptoms, the differential diagnosis, the prognosis, and the treatment.

Fracture of the acetabulum with central dislocation of the femoral head has a high mortality and is fortunately rare. Depression of the trochanter and rectal palpation of the femoral head are important diagnostic signs, but every case should be X-rayed. The complications, which are frequent and severe in nature, demand immediate recognition and treatment. The successful repair of the fracture dislocation depends much on its early diagnosis. Reduction by manipulation is recommended. Open operation is necessary only in the exceptional case or for the treatment of complications. Resection of the femoral head is unnecessary. When the dislocation is irreducible, manipulation under general narcosis has yielded excellent results in freedom of motion and ability to use the leg.

E. C. ROBTSHEK.

Phemister, D. B.: Reparative Surgery of War Wounds of Bone as Illustrated by Fractures of the Femur. *Surg. Clin. Chicago*, 1919, iii, 807.

In cases of fractures among the soldiers sent back from overseas, the problem presented is largely that of chronic infection, long-standing malposition, and partial or complete interruption of continuity resulting from loss of bone substance. The most important of these is persistent infection which follows the acute infection occurring at the time of injury and leads to a variable amount of dead bone and an alteration in the callus.

The fractures are usually comminuted and necrosis of the splinters is common, especially when they are completely detached. Loss of vitality is apt to occur in the ends of the fragments, especially when they are pointed, and also along the margins of oblique fracture lines. Destructive changes lead to the formation of a variable number of sequestra. The pieces of dead bone lie in pockets surrounded by masses of exuding granulations which exert a more or less abortive action upon them. If the dead bone is pocketed where the granulations have a better chance for attack, the absorption may be considerable and continued irregular reduction in size will occur. If it lies in larger open spaces, however, and is continually bathed in the pus of discharging deeper portions, destruction may be very slight.

The new bone bridging the fracture is irregular in its distribution according to the location of the dead bone. The dead fragments may be gradually broken up, extruded, or absorbed, in which event the sinuses with rigid walls usually remain and are filled with granulation tissue which contains bacteria and is not converted into scar tissue. Thus the sinus remains open. The cavity may be very irregular, with several arms or openings. In the medullary region tunnel formation is very common.

Rational therapy is based on the recognition of the presence of dead bone and its removal and the effacement of abscess cavities, pockets, and tunnels.

This effacement is brought about by the removal of a sufficient amount of the surrounding new or old bone to allow the soft parts to fall into the space and fill it. The incision or incisions are so placed that periosteum and soft parts are removed as nearly as possible only from the bone which is to be excised. This prevents unnecessary denudation of bone to be left which would lead to its infection and death. The work may be done in a single or two-stage operation, depending on the strength of the callus and whether removal of dead bone and effacement of cavities will weaken it too much. When the bone has been much weakened, splinting or a cast is essential. Radical operation should never be attempted in the presence of an acute exacerbation. The wound in the soft parts is usually left open and loosely packed with gauze. As a rule even partial closure is unsafe. Carrel-Dakin technique is used as a routine measure. Eight illustrative case histories are given. I. W. BACH.

Driberg, J.: Methods of Treatment of Fractures of the Femur. *Lancet*, 1919, cxcvii, 311.

The author classifies the methods of treating fractures of the femur into two main groups, surgical and mechanical.

Compound fractures require surgical treatment. This should consist of excision followed by packing with flavine or another antiseptic which is left in place for three days. The wound should then be sutured and a rubber drain inserted for from twenty-four to forty-eight hours. The same measures are advised also in civil practice when there is gross infection. Hæmorrhage of secondary nature, which is now more uncommon than formerly, is treated by ligation and if necessary transfusion of normal gum saline solution. In all cases of wound soiling 1,500 units of antitetanus serum are given, followed in eight days by $\frac{1}{4}$ grain doses of morphia every four hours. When tetanus has developed, from 10,000 to 12,000 units of antitetanus serum should be given intramuscularly.

Mechanical treatment requires an overhead frame to allow suspension. For all fractures of the femur the author believes the Thomas splint is adequate. In some cases adhesive plaster, Sinclair's glue, or mastisol is used. Driberg discusses also various traction apparatus, calipers, steel pins, screws, and Schutro's stirrup. The calipers are best unless contra-indicated as they allow earlier union, joint movements, and massage, and provide traction.

The various fractures of the upper, middle, and lower one-third of the femur are discussed with special reference to the method of treatment by means of the Thomas splint and the knee-flexion splint. Emphasis is laid upon the importance of daily observation and the value of radiographs taken at intervals of from two to three weeks. Massage of the limb and passive motion of the knee-joint during the first three weeks are recommended. The latter should be done by the medical attendant himself.

Radiographs and palpation are of importance in determining the length of time the leg should be kept in the splint. Usually the author gets the patient up with "walking calipers." These consist of a Thomas knee-splint with the lower end cut off and the loose points turned in and fitted into a hole drilled through the heel of the boot. At the end of six months of walking with the caliper boots they may be discarded as the X-ray will show the presence of a firm, hard callus.

In the discussion of complications are included mal-union, delayed union (up to twelve months), and non-union (after twelve months), tetanus, nerve lesions, neuralgic pains, and stiffness.

In conclusion it is stated that by the methods described a perfect result can be obtained in the vast majority of cases. However, a fracture of the femur requires constant care and attention to detail. The adjustment of the slings, the maintenance of extension, the movements of the knee-joint, the correct suspension with slight eversion of the limb, the prevention of foot-drop, the use of massage, and the upkeep of the general health and nutrition, each plays its part in the attainment of perfection, and if anyone of these factors is neglected the result is apt to be disappointing. H. W. MEYERDING.

SURGERY OF THE BONES, JOINTS, ETC.

Donoghue, F. D.: *Surgical Treatment to Prevent and Minimize Permanent Disabilities.* *Boston M. & S. J.*, 1919, clxxxi, 364.

Permanent disabilities may be prevented and minimized by proper surgery.

Cases should not be sent to institutions not properly equipped to render the correct diagnosis and treatment, nor to the unqualified surgeon. The two great causes of deformity of the hand are sepsis and fracture. A great many cases of sepsis occur as a result of placing too many sutures too tightly in a small skin wound. Nearly all skin wounds due to industrial accidents may be treated by the careful application of perforated adhesive plaster with a sterile dressing and, most important, a splint. These cases do better with a dry dressing, probably because long-continued soaking renders the subcuticular tissues a good culture medium for bacteria.

A poorly reduced, an unrecognized, or a slipped fracture of a metacarpal bone will cause a greater period of disability than a poorly treated Colles fracture. The average period of disability from an impacted Colles fracture is about eight weeks. The metacarpal bones are in close relation to seven tendons each; also to the lumbricales and interossei muscles. Therefore injury to the metacarpals interferes to a great degree with the function of the hand and fingers, producing chronic pain and disability. In many cases fracture of the metacarpals may be the beginning of a crippled hand. Compound fracture of the fingers or simple fractures in poor position may cause long-continued disability and eventually require amputation.

Removal of the smaller fragments by a careful dissection gives a much better working hand than any other method of treatment. A man with a thumb, an index finger, and a little finger can get along almost as well as one who has all his fingers. Tendons that have sloughed may be replaced with fascia lata grafts. Not every surgeon is qualified to operate on the hand. J. J. KURLANDER.

Bloch, L.: *Non-Union of Fractures.* *Am. J. Surg.*, 1919, xxxiii, 190.

After complete reduction of a recent fracture the process of repair is as follows: (1) the formation of a provisional callus; (2) the invasion of osteoblasts; (3) calcareous deposits formed around the osteoblasts; and (4) the absorption of functionless osseous formations. Interference with this physiological process results in non-union. Other factors causing non-union are defective reduction of the fragments; too much motion; interposition of periosteum, muscle, fascia, or a fragment of detached bone; interference with the blood supply due to vascular injury or too tight bandaging; disturbance of the nerve supply; fixation of the bone by foreign bodies; tuberculosis and syphilis and other infectious and debilitating constitutional disorders.

Non-union may be the result also of delayed union. In such cases union may be brought about by the stimulation of motion. In some instances a fibrous band may be found uniting the fragments. In fibrous union and pseudarthrosis, other types of non-union, open operation is the best procedure. In pseudarthrosis driving a live bone graft with periosteum into the medullary canal is the best means of stimulating osseous repair, whereas in fibrous union the defect should be bridged with a live bone transplant.

Three case histories are given. I. W. BACH.

Cotton, F. J.: *The Treatment of Infected Bone Wounds.* *Boston M. & S. J.*, 1919, clxxxi, 379.

Cotton reports the work done in reconstruction hospitals in the treatment of septic bone cases; first, because it has been good; second, because it is so eminently the contribution of military surgery in a field in which our civil practice has signally failed in the past; and third, because there is danger that the successful methods evolved may not be applied to civil practice.

Success in the treatment of such cases depends upon active antisepsis in infected wounds and requires a knowledge of the Carrel-Dakin technique, expert surgery, common sense, and organized industry.

In the cases in which this technique was impracticable—due most often to the hypersensibility of the skin—sterilization with 95 per cent alcohol or carbolic and bone-wax plugging were used. This treatment has its place when the cavity is well defined and can be cleaned to a firm wall and properly sterilized. While bone grows more quickly when Dakin solution is used, this is a very good method and is

usually effective when indicated. The wax is extruded slowly, leaving the osteoid tissue behind it clean. Good judgment and technique are necessary.

In cases in which it was impracticable to do a secondary closure, the procedure was to use Carrel-Dakin for a month until the wound was clean, then bismuth paste, and later a paraffin and sesame mixture to fill the cavity. This method is slow but during the treatment the patients are up and about, without pain or sepsis, and require infrequent dressings. The treatment is a protection against centripetal infection, chilling, and drying. Bone so protected, if clean, forms osteoid tissue cleanly and fairly rapidly.

The author believes that routine scientific treatment, well co-ordinated, brings us to a point at which infection in bone can be handled with the precision and practical uniformity of results long desired but never within our reach before the recent war.

H. A. MCKNIGHT.

Soresi, A. L.: A New Method of Treating Osteomyelitis and Bone Necrosis (Un nuovo metodo di cura dell' osteomyelite e necrosi delle ossa). *Arch. di ortop.*, 1919, xxxiv, 338.

Soresi's method of treating osteomyelitis and bone necrosis, which is very simple, consists of making a number of small holes in the bone so that it is perforated somewhat like a grater. These perforations are made over the entire exposed part of the bone from 3 to 4 millimeters apart. Their depth depends on the thickness of the necrosed bone or, in the case of osteomyelitis, on the thickness of the external part of the bone as far as the medulla. In cases of necrosis, trepanation of the bone ought to be done without an anæsthetic because if the bone is really dead there is no sensibility. In the cranium, of course, only the external table is perforated.

The principle on which Soresi's method is based is that such perforation facilitates the penetration of granulations into the holes so that in a short time they cover all the exposed part and skin may be grafted from the vicinity.

Soresi has applied this method successfully in 7 cases, 4 of necrosis of the tibia, 1 of cranial denudation, and 2 of acute osteomyelitis of the femur. While he is not yet able to report a definite recovery, the necrosed bone in all cases has been resorbed and its place has been taken by bone cells of new formation. A further and more detailed report of these cases will be made later.

In cases of osteomyelitis trepanation of the bone as described facilitates the discharge of pus without weakening the bone and accelerates the cure. The treatment is not limited to trepanation, however, for medication is of the greatest importance. In osteomyelitis paraffin drainage (which Soresi described in a previous article) is used as well as other methods. In necrosis paraffinated tampons, cold packs, boric acid, and other medical agents are employed.

W. A. BRENNAN.

Bennett, G. E.: Preliminary Report of Lengthening of the Quadriceps Tendon. *J. Orthop. Surg.*, 1919, i, 530.

Loss of flexion of the knee-joint following trauma or inflammatory lesions of the femur has been seen frequently, notably as an end-result of a fracture of the lower third of the femur in which there is no damage to the joint but adhesions have formed in the muscles of the thigh.

In discussing the anatomy of the quadriceps the author quotes Sabotta-McMurrich verbatim. Pathologically, long immobilization with complete flexion will cause actual shortening of a tendon and muscle which will give permanent disability and resist all but operative treatment. This is most commonly seen in contracture of the tendo achillis following long plantar flexion. In addition, during long fixation adhesions may form between the muscles and femur or between the muscles themselves.

On the basis of this hypothesis, the author describes and illustrates his operation for lengthening the quadriceps. The method used depends upon determining the section of the quadriceps which is adherent. If the rectus femoris branch is at fault, the middle two-third portion of the quadriceps tendon is separated from the patella and, the knee being then forcibly flexed, is re-attached at a higher level to the new tendon made by stitching together the external and internal vasti. If the two vasti are contracted more than the rectus, however, they are freed from the patella and from each other, the central section of the tendon is severed at the point of adhesion above, and the knee is forcibly flexed. A longer tendon is thus obtained. Massage, stretching, and passive motion only are used for four weeks.

Three cases are cited: osteomyelitis of the femur, fracture of the lower femur, and fracture of the patella.

R. G. PACKARD.

Irwin, S. T.: The Preparation and Fitting of Amputations in the Lower Limb. *Thesis*, 1919.

Irwin's paper is an outline of the experience gained during eighteen months' work in the Limbless Department of the U. V. F. Hospital. During this period there were 328 admissions; 110 patients required further operation to make limb fitting possible and of these 44 had re-amputations.

The paper is divided into three parts as follows: (1) general requirements in leg amputations; (2) a consideration and comparison of amputations at the various levels: (a) in the foot and ankle; (b) in the leg; (c) in the region of the knee; (d) in the lower part of the thigh; (e) in the region of the hip; and (3) a consideration of the variation in capacity for work following amputations at the various levels.

The requirements which are special to amputations in the lower limb are: (1) support, (2) stability, (3) progression, (4) resemblance to the normal configuration.

Support is best obtained by what is called an "end-bearing stump." Nature's end-bearing stump

is the heel, and therefore the aim of the surgeon should always be to obtain a stump which as much as possible resembles the heel in form and structure. The heel consists of skin, a dense thick layer of fat limited by layers of superficial and deep fascia, and cancellous bone which is convex in shape and covered by a thin layer of compact bone on the surface. The stump most resembling it is obtained by the Syme amputation. This method takes advantage of the actual skin of the heel which is accustomed to bear pressure and includes the thick pad of subcutaneous fat. The bone is formed by the cancellous lower ends of the tibia and fibula. These are sawed across just above the level of the articular cartilages, the edges of the saw cut being nibbled off to make the surface convex in shape. Only the thin layer of compact bone on the surface is lacking to make the resulting stump identical with the ideal stump designed by nature. The stump is a complete end-bearing stump capable of permanently supporting the whole weight of the body, the only requirement being a pad between its end and the bearing surface of the artificial limb.

Support can be obtained also by lateral bearing. This is used especially in leg amputations when end-bearing is incomplete. The most common site for lateral bearing is below the knee in amputations of the leg made above a Syme amputation. The disadvantages of lateral bearing are fraying, blistering, and infection of the skin, pressure sores or bunions over projecting bone, and contusion or pressure on the nerves or nerve bulbs.

The surgeon's aim should be to obtain a complete end-bearing and, failing in this, a partial end-bearing to be supplemented by a lateral bearing or ischial bearing. The function of support will therefore depend on how far it has been possible to make the extremity of the stump capable of bearing the weight of the body.

The second important consideration is stability. This depends on the length of the natural limb as compared with the artificial portion, and on the length of the stump measured from the first joint proximal to the amputation. Stability will always be better in leg than in thigh amputations, and better following a Syme amputation than an amputation through the so-called seat of election. Stability presents a difficult problem in short thigh amputations, requiring in such cases a laced socket, a pelvic band, or even a fixed knee-joint. Critchley has provided for this by placing a brake in the knee-joint which automatically comes into action when any pressure is applied to the toe.

Progression depends on: (1) the length of the natural as compared with the artificial part of the limb, and (2) the command which the patient is able to exert over the artificial part. The latter is largely a question of muscular power and the weight of the limb.

Appearance is of only secondary importance as compared with the requirements mentioned.

In regard to the site of the operation, the author

bases his remarks on the problems of amputations as they present themselves to the surgeon in charge of a limb-fitting hospital.

Amputation of toes: The author believes it is always advisable if possible to retain the great toe. It is rare that a soldier with a serious injury or amputation of the great toe can be classified in Class A, and there is no special fitting which will improve the function of a foot so handicapped.

Amputation in the foot: All amputations through the foot have the disadvantage of shortening the anterior limb of the anteroposterior arch. The greater the shortening of the limb, the greater the interference with the equilibrium of the foot.

Of the operations through the ankle-joint the amputation devised by Syme is perhaps the best. The skin of the heel is utilized to take the bearing. An ample length of lever gives firm stability, and this, with the preservation of the natural knee-joint, makes possible an almost perfect if not perfect gait. The only criticism of the method is that the artificial ankle is rather bulky.

Amputation in the leg: Certain points must be kept in mind: (1) the longer the lever, other things being equal, the better the function; (2) an amputation through the so-called "seat of election" must be regarded as the limit of shortness; and (3) the skin of the lower third of the leg is apt to undergo atrophic changes and therefore is not very suitable for covering a stump end—it rarely gives an end-bearing stump. In the author's opinion the level of election is the juncture of the middle and lower thirds of the leg, and the best method the formation of long antero-external and short postero-internal flaps. This gives ample leverage and, usually at least, a partial end-bearing.

Amputation in the region of the knee: In the treatment of old persons with tumor or gangrene of the leg the classical operation of disarticulating through the joint devised by Stephen Smith has some advantages. In healthy young subjects its disadvantages are overwhelming. When the patella is freely movable and the skin sound, the Stokes-Gritti is the operation of choice. According to this method the articular surface having been removed from the patella, the latter is turned up against the sawed surface of the femur. The main advantages are: (1) a good end-bearing stump covered with skin well suited to take pressure; (2) ample leverage for activation of the artificial limb; (3) a posterior scar free from pressure; and (4) a knee-joint placed almost on the same level as on the sound side. The main drawback is the failure to obtain bony union between the patella and the femur owing to sepsis or muscular action which pulls the patella forward and upward.

Amputations in the lower part of the femoral shaft: For amputations in the lower part of the femoral shaft there are two forms of operation: (1) the Spence-Sedillot (long, broad anterior and short, narrow posterior flaps), and (2) the circular, modified circular, or guillotine amputation.

Amputations in the region of the hip: Amputations above the middle of the thigh present great difficulties to the limb-maker as well as to the surgeon. Huggins lays down the rule that unless from $2\frac{1}{2}$ to 3 inches of bone are left below the small trochanter, a very unsatisfactory thigh stump results. For amputations above the mid-thigh a pelvic band is required to maintain stability and to prevent rotation of the artificial limb and dislocation of the limb when the patient sits down.

In his discussion of the variation in function following amputation at different levels of the leg, the author states that in general it is found that following all amputations it is possible to fit the patient with a limb which will allow him to get about with at least a fair degree of comfort, but that there is a very great variation in the work he is able to do. In estimating the capacity for work we must consider: (1) the length of the natural as compared with the artificial limb; (2) the specific value of the ideal amputation at the particular level; (3) the type of prosthesis most suitable for the particular stump; and (4) the special conditions which prevail in the individual case, that is, how far the particular amputation performed falls below the ideal amputation at the same level.

The variations in capacity for work following amputations of the leg are illustrated by a drawing.
G. W. HOCHREIN.

David, V. C.: Gunshot Injuries of the Knee-Joint in a Base Hospital. *Ann. Surg.*, 1919, lxx, 290.

A group of gunshot injuries of the knee-joint treated in Base Hospital No. 13 are considered in this paper from the standpoint of the original lesion, the type of operation performed at the front, and the subsequent complications and their treatment as related to the function of the joint. Forty-nine of the patients were operated upon at the front on an average of one and eight-tenths days after the injury, and of these, 42 were treated surgically within twenty-four hours after the injury. Of the whole group, 31 (56 per cent) remained uninfected after operation, and 24 (44 per cent) became infected.

In David's opinion the influence of early operation in the prevention of infection is demonstrated by the results in 7 cases operated upon later than twenty-four hours after injury. Five became infected, the average time of operation being eight days after injury.

The article is summarized as follows:

1. Of the gunshot wounds of the knee coming to a base hospital after operation at the front, 56 per cent remained uninfected and 44 per cent were infected.
2. Five of the infected cases required amputation and there was one death.
3. Infection of the joint plays the most important rôle in decreasing its function.
4. Early operation at the front, thorough excision of the wound, removal of foreign bodies and loose

bone fragments from the joint, and closure of the capsule of the point are the most important elements in preventing infection of the joint.

5. Almost 50 per cent of joints with fractures of the articular surfaces became infected after operation, whereas only 33 per cent of other types of injury to the joint became infected.

6. Of the high explosive fractures of the condyles of the femur nearly 60 per cent were uninfected after operation. Fractures of the tibia did not do so well.

7. Joints remaining uninfected after operation for fracture of the articular surfaces had normal motion; in 70 per cent of the cases there was 90 per cent active motion.

8. Whenever possible, injured or infected joints were actively mobilized after operation, but active mobilization is not practicable in all war injuries of the joints.

9. In all of the infected joints which were necessarily immobilized, only 10 degrees or less of active motion was possible two months after the injury. Of those actively mobilized immediately after drainage of the joint, 2 had normal motion and the remainder better than 20 degrees of active motion two months after the injury. E. C. ROBITSHEK.

Pool, E. H., and Jopson, J. H.: The Treatment of Recent Wounds of the Knee-Joint. *Ann. Surg.*, 1919, lxx, 266.

One of the most important lessons which war surgery has taught us is the amenability to surgical treatment of wounds of the large joints. The pessimistic views which were formerly held in regard to these lesions were due to an undervaluation of the resistance to contamination and infection which the synovial membrane of a joint offers, and failure to comprehend the proper operative procedures. The features which are of importance in the treatment of battle casualties of other types, early operation and complete excision of traumatized and contaminated tissue, are likewise indicated in the treatment of wounds of the large joints. But, whereas in other types of wounds it is often found advisable to leave the wound unsutured and to supplement the operative treatment by chemical sterilization, in the case of a joint primary closure of the synovial membrane is essential to success, and unsutured joints with or without postoperative chemical sterilization have not in general proved satisfactory.

All wounds of joints by projectiles, except certain perforating wounds due to bullets, should be operated upon.

The principles of conservative treatment are: complete excision of the track of the projectile through the joint; absolute closure of the joint by suture; primary or delayed closure of the superficial parts; and finally, early active motion.

The incisions must be placed so as to permit not only thorough excision of the soft parts, but also free access to the foreign body and the involved bone. Longitudinal lateral incisions are to be pre-

ferred when practicable and transverse when absolutely necessary, but division of the patellar tendon should rarely be done. After excising all traumatized soft parts the capsule of the joint should be opened and the immediate involved capsule excised, but great care should be taken that no traumatization of the synovial membrane occurs. Foreign bodies must be removed; also loose fragments of bone. The joint should be thoroughly irrigated with salt solution and then distended several times with ether. The synovial membrane and capsule should be closed with fine catgut. When feasible, these two layers should be sutured independently. Complete closure of the joint is the invariable rule.

When a considerable area of condyle or articulating surface is partially detached but retains good contact with the overlying soft parts, the fragment should be left after the track has been followed and the fractured surfaces have been cleansed. If an attached fragment is to be removed, this should be done if possible by the method of Leriche, using his modification of the sharp Ollier elevator. Compound fractures of the patella should be treated by removal of the completely separated fragments and preservation of large attached fragments which should be approximated by suture. Complete removal of the patella should be avoided since the functional result is poor.

In extensive involvement of the articular surfaces, an effort should be made to save the joint, but when there is such a loss of articular surfaces as to preclude obtaining a useful joint, resection should be elected as in the knee stability is essential.

When there is such destruction of soft parts that the edges of the capsule cannot be approximated and an attempt is to be made to save the joint, the defect in the capsule should be completely closed with muscle or fascia. In all cases before the joint is closed complete hæmostasis should be obtained.

Early active mobilization is the rule. The patient should be encouraged and directed to move the joint, and if there has been no removal or suture of the patella, a splint need not be applied. Early use of the joint is essential for early function.

If the joint becomes distended and infection is suspected, it should be aspirated immediately and a culture taken. If the patient's condition, the local examination, or the character or culture of the aspirated fluid indicates pyogenic infection, lateral incisions should be made at once.

In cases in which there is suppurative arthritis of the knee-joint, Willems' method is recommended. The important feature is to drain early. Lateral incisions well back are best. No drains should be used. Splints should be dispensed with or arranged for support without joint fixation. Free mobility should be enforced every two hours by active movements so as to evacuate the joint.

An analysis of the cases operated upon by the authors in Evacuation Hospital No. 1 has confirmed them in the opinion that a conservative policy in dealing with wounds of the knee-joint caused by

projectiles is justifiable and strongly indicated, whether it be viewed from the standpoint of mortality, preservation of the limb, or maintenance of function. It has shown them that infection can be avoided in the great majority of cases; that even when intra-articular infection develops function can sometimes be preserved, or if lost, that amputation is not inevitable. Finally, it has demonstrated that early active motion of the joint offers the best chance for an early and complete restoration of function.

H. A. McKNIGHT.

Whitman, R.: The Loop Operation for Paralytic Equinovalgus, with Remarks on the Principles of Operative Treatment of Paralytic Deformities of the Foot. *J. Orthop. Surg.*, 1919, 1, 459.

The operation described was designed primarily for confirmed equinovalgus caused by paralysis of the tibialis anticus muscle which is often combined with weakness or paralysis of the posticus as well.

In such cases all the dorsal tendons were displaced outward, a displacement that increased their effectiveness as abductors.

The loop operation was designed to rebalance the muscular power and to restrain as far as possible the secondary tendency toward deformity. The direct abducting force was lessened by removing the peroneus brevis and tertius. Dorsal flexion was aided by transplanting the peroneus brevis and the longus hallucis to the inner border of the foot. Finally, the dorsal tendons were freed from the underlying tissues, displaced to the inner border of the foot, and held in this position by passing beneath them the tendon of the paralyzed tibialis anticus previously cut from its muscular attachment. This was then drawn upward and embedded in a groove cut in the inner border of the tibia, thus forming a loop which restrained the dorsal tendons from outward displacement and served as a support to hold the foot at right angles to the leg and slightly adducted. By this operation all the muscles except the paroneus longus serve in some degree as adductors, and if a free range of dorsal flexion is preserved by after-treatment relief is assured.

In the author's opinion surgical treatment is indicated for all paralytic distortions of the foot and as soon as the permanence of the paralysis can be established. Its purpose is to assure stability and thus to displace mechanical support. From this standpoint the various operative methods were analyzed and the conclusion arrived at that there are two to which all others are subsidiary, i. e., tendon transplantation and astraglectomy and backward displacement of the foot.

Tendon transplantation was much overrated in the past since it was performed on the theory that a transplanted muscle would increase in strength in accommodation to its new and more arduous function, whereas the contrary is the fact because of the unfavorable mechanical conditions to which it is subjected. Tendon transplantation cannot sup-

ply power; it can only distribute it to better advantage. Consequently as an independent operation it is effective only for lateral distortion of the foot.

Astragalectomy and backward displacement of the foot has by far the wider range. If properly performed it prevents lateral deformity and by checking dorsal flexion restores the resistance of the foot in locomotion. It permits plantar flexion and thus the adjustment of an inoffensive shoe to compensate for the shortened limb which is an inevitable consequence of anterior poliomyelitis in childhood. With this operation tendon transplantation was combined when possible, the peronei being transplanted to the tendo achillis for calcaneus, and the tibialis anticus to the outer border of the foot for varus.

Fuld, J. E.: The Surgical Treatment of Hallux Valgus and Its Complications. *Am. Med.*, 1919, xxv, 536.

After a thorough trial of the various operations for the relief of bunions, the author found it most advisable to transplant the tendon of the abductor hallucis from its usual insertion in the plantar surface of the base of the first phalanx to the periosteum covering the middle of the inner surface of the same bone. The steps in the operation are as follows:

1. Under general anaesthesia forcibly move the great toe in all directions, stretching the tissues.
2. Paint the foot and toes with iodine.
3. Make a curved incision to expose the bony prominence. Dissect a semicircular flap of skin and subcutaneous tissue, free it from the bursa, and turn it down over the joint.
4. Retract the soft parts. Dissect the tendon of the abductor hallucis free from its attachment to the base of the first phalanx.
5. Turn the flap including the bursa, capsular ligament, and periosteum down, exposing the bony deformity.
6. Chisel the hypertrophied bony projection of the head of the metatarsal longitudinally backward.
7. Irrigate the wound with hot saline solution.
8. Replace the capsule to cover the raw surface of the bone and fix it with catgut.
9. Divide the contracted internal lateral ligaments and fascia subcutaneously.
10. Transplant the tendon of the abductor hallucis to the middle of the inner surface of the first phalanx and suture it with fine silk or Pagenstecher thread to the periosteum.
11. Close the skin and apply a plaster of Paris bandage to hold the toe in a slightly overcorrected position for from seven to ten days. **PHILIP LEWIN.**

ORTHOPEDICS IN GENERAL

Boveri, P.: The So-Called Reflex or Physiopathic Paralysis and Contractures (Nuova contributo sulla paralisi e contratture così dette riflesse o fisiopatiche). *Riforma med.*, 1919, xxxv, 502.

Boveri argues that the contractures generally diagnosed as reflex have a true organic origin and

are due mostly to the presence of foreign bodies. He refers to the nerve endings in the muscles and tendons—the corpuscles of Golgi—from whence originate all centripetal sensory stimuli. It is obvious that a foreign body situated in the muscle mass or tendon may act as an excitant causing contracture.

Mention is made of the case of a soldier who had contractures in the right forearm, hand, and fingers after having been wounded in the arm by a fragment of grenade. There was no fracture nor could any lesion of the joint or nerve trunk be demonstrated. The continued hypertonicity of the biceps and anterior brachialis, however, raised the suspicion that a foreign body was acting as an irritant and was the cause of the contracture. Radiography confirmed this suspicion by disclosing two humeral exostoses. These two neoformations acted as foreign bodies. The contracture of the forearm and fingers was not the result of either simulation or a functional disturbance, but was based on the organic lesion of the humerus.

The term “reflex contracture” should be discarded. Forms of organic nature will be discovered very much more frequently when the true cause is sought for and found.

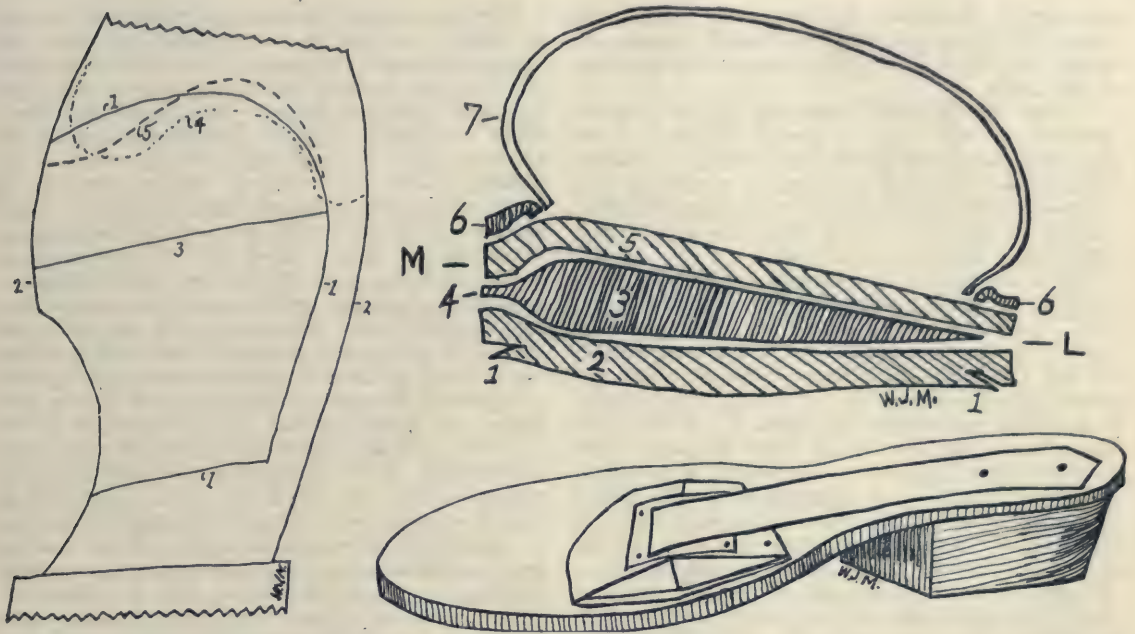
The same may be said of the position of the foot in talipes equinus. This is in great part a consequence of a vicious attitude maintained over a long period and due initially to an antalgic position. It sometimes happens, however, that wounds in the region of the calf of the leg and more especially toward the tendo achillis leave cicatrices which constrict the fine nerve endings. Such cicatrices are equivalent to foreign bodies constituting points of permanent irritation, and form the pathogenic substratum of contracture. The application of corrective apparatus, even if worn for a long time, will not cause permanent improvement and when removed the foot will again resume its previous abnormal position which will be maintained as long as the real cause persists.

W. A. BRENNAN.

Merrill, W. J.: Mesial Triprism. *J. Orthop. Surg.*, 1919, xvii, 434.

The mesial triprism, a support to be placed between the soles of the shoe, consists of three prisms, one running forward, the second running backward from the midline, and the third, formed by the first and second, extending from the mesial side outward but not beyond the distal head of the fifth metatarsal. The support may be extended backward to any desired point. Its anterior limit is determined by putting the shoe on the foot, finding the joint lines of the first and fifth metatarsophalangeal joints, marking the three points on the sole of the shoe, drawing a line between these points, and curving the anterior edge of the triprism as indicated. The anterior thickness should be made to suit the given case.

This device is made of two layers of leather or one of leather and the lower layer of rubber and is held



Left: Outline of tripism showing its limit laterally and the possible variations of the anterior edge. 1, usual form; 5, to extend under second, third, and fourth metatarsal heads; 4, to form a depression for the ball of the great toe. Right, above: Cross-section of tripism at 3 (figure

at left). 7, upper; 6, welt; 5, inner sole; 4, mesial edge skived down to be stitched between soles; 3, cross-section of tripism at thickest point; 2, top-sole; 1, channel for stitching; M, mesial, and L, lateral sides. Right, below: Placing of tripism and the steel shank.

in place by a shaft of flexible spring steel. No. 16 sheet spring steel is recommended, stiff enough to hold its desired shape under the necessary weight.

According to the author this apparatus retains the normal arch of the foot as it supports the foot on its normal weight-bearing points. He has used it with success in the treatment of flattening, pronation, and valgus, and torsion of the tarsus as

it does not apply strain to the outer side of the foot as do most shifting devices such as arches and supports.

It is not claimed that it is possible to cure foot conditions by the use of the mesial tripism alone but the support described is recommended as a valuable adjunct to the well-known constitutional and local therapy.

M. H. HOBART.

SURGERY OF THE SPINAL COLUMN AND CORD

Sharpe, N.: Operation of Spinal Decompression.

Am. J. M. Sc., 1919, clviii, 335.

The value of spinal decompression in obscure lesions of the cord or in cases in which the diagnosis is doubtful is not fully appreciated. This paper discusses the value of exploratory laminectomy in such instances and of spinal decompression in certain selected cases of well-recognized forms of cord disease which were formerly not considered amenable to surgical interference.

In recent fracture of the spinal column with involvement of the cord an early decompressive laminectomy will allow the removal of blood clots and will obviate the compressive effect of oedema in and about the cord.

In many old fractures of the cord which for some

reason were not operated upon at the time of injury a simple exploratory or decompressive laminectomy will often give astonishing and brilliant results.

In certain cases of multiple sclerosis in which the signs point to a focusing of the disease process in the lower part of the cord remarkable improvement often follows simple laminectomy. The author cites four cases of this type, two of which showed definite improvement, one an astonishing degree of improvement, and the fourth, no improvement at all.

In certain cases of well-developed syringomyelia in which the signs point to the presence of a single cavity which does not involve the bulb, as in the lower cervical or upper dorsal region, and when the increasing intensity of the symptoms points to

progressive distention of the cavity with fluid rather than to a spread of the disease process, the author believes it justifiable to operate for drainage of the cavity.

In one case in which there was flaccid atrophic paralysis of both arms, a spastic paralysis of the legs, and dissociated sensory disturbance, laminectomy in the lower cervical region, performed two years ago, resulted in such marked improvement that the patient is able to walk with a less spastic gait and to raise his arms to his head.

Under the heading of unclassified cases the author cites one in which laminectomy gave a brilliant result. The patient was a man of 31. In September, 1917, a small abscess in the left nostril was incised. During the following three months abscesses appeared in succession in the left orbit, the left cheek, and the left side of the neck back of the ear. The last abscess was not healed until January, 1918, at which time the patient complained of pain and stiffness of the neck. A diagnosis of cervical Pott's disease was made and the head and neck were immobilized by a stiff brace which was worn for six months. In June, 1918, a numbness was noticed in the right hand and weakness of the left arm and hand. In one month this had progressed to a left hemiplegia (face not involved), with sensory disturbances over the right half of the body, excluding the face. The condition was then diagnosed as luetic bone disease of the cervical vertebrae, though two blood Wassermanns at this time were negative. Later two blood Wassermanns and one on the spinal fluid were negative. In January, 1919, complaint was made of beginning weakness of the right hand and arm. The signs pointed to a lesion of unknown character at the level of the third and fourth cervical segments. Examination of the pharynx disclosed a small sinus running downward toward the body of the third cervical vertebra.

Laminectomy was performed January 29, 1919. The dura was tense and deeply indented on the left side at the level of the third vertebra by a small projection of bone (exostosis) into the canal. This was removed and the dura rounded out. The dura was reclosed and the wound closed with one drain. The head and neck were immobilized with a molded plaster of Paris splint.

Eight days after operation the patient was able to move the left foot and left fingers more freely than for six months. Three weeks after operation he could flex and extend the fingers of the left hand separately and put his hand on the top of his head. He was able also to walk with less difficulty. Four months after operation he walked well without a cane and at the time the article was written was steadily improving.

The most probable diagnosis was osteitis of the second and third cervical vertebrae, with inflammatory reaction in the cord meninges and retention of fluid, or thrombosis or pressure obstruction of the spinal vessels of the left side of the cord at the level of the second and third vertebrae.

The technique of laminectomy consists in making a vertical incision in the median line over the spinous processes, incising the muscles on both sides close to the spinous processes, and packing the incisions with hot gauze. The laminae are then freed of muscles with a broad-blade periosteal elevator, and a large self-retaining retractor is inserted. By this method venous bleeding is effectively checked and the operative field is kept comparatively dry. The ligaments of the spinous processes are then divided and the processes removed with large special rongeurs. The laminae are rongeur'd away, the spinal canal being opened and the dura exposed. This portion of the operation should be performed as rapidly as possible. The spinal canal is then explored by means of a probe or grooved director on all sides, both above and below the operative field. If a removable lesion is found, such as a tumor or blood clot, the dura may be reclosed. If the operation is a decompression for a known lesion, the dura is left open. The wound is closed in layers with chromic gut, care being used to approximate the muscle layers well and not to leave any dead spaces. A single rubber-tissue drain running to the depths of the wound is inserted. This is removed in from twenty-four to forty-eight hours. A molded plaster of Paris splint will give support to the spinal column and increase the patient's comfort.

G. W. HOCHREIN.

Pfahler, G. E.: The Treatment of Metastatic Carcinoma of the Spine by Deep Roentgen-therapy; with Report of Four Cases and Remarks on the Pre-Operative Treatment of Carcinoma. *Surg., Gynec. & Obst.*, 1919, xxix, 236.

As a result of the study of the four cases described in this article, the author draws the following conclusions:

1. When applied properly and in sufficient quantity upon deep-seated cancer tissue, the roentgen rays may be expected to destroy the cancer cells. These cells are replaced by healthy scar tissue or fibrous tissues, and when located in bone, by bone sclerosis.

2. As a result of the healing process, the patient's life is prolonged and he is made comfortable.

3. A complete, permanent recovery cannot be expected for ultimately the disease is apt to form metastases, particularly in the areas which have not been treated.

4. It is very probable that in cases of metastatic carcinomata of the spine without other evidence of metastatic involvement the patient's natural resistance is unusually great as in many, if not most, cases death results from visceral involvement before there is time for symptomatic disease to develop in the spine.

5. On the basis of the clinical and microscopic proof of the destructive action of the roentgen rays on malignant tissue, which is followed by healing, and the experimental proof of a decrease in the malignancy and power of inoculation of cancer tissue

which has been exposed to these rays, the use of deep roentgentherapy is to be strongly recommended both as ante-operative treatment to be followed immediately by operation and as postoperative treatment given after the proper interval, i.e., four weeks after the ante-operative treatment.

E. C. ROBITSHEK.

Richard, A. J.: Pain in the Lumbosacral Region Associated with Congenital Malformation of the Transverse Processes of the Fifth Lumbar Vertebra. *Am. J. Roentgenol.*, 1919, vi, 434.

Anomalies in structure of the bones of the lumbosacral region, particularly of the transverse processes of the fifth lumbar vertebra, are not uncommon in patients complaining of orthopedic back conditions. The author, a roentgenologist, classifies such anomalies into four groups. In the first group one or both transverse processes are longer and larger than normal and may or may not be in contact with the sacrum and iliac bones. In the second group the process or processes are markedly larger than normal and have taken an upwardly oblique direction from the sacrum and iliac bones, leaving very little space between them. The third group show a downward turn of the large process overshadowing the ilium and sacrum which sometimes forms a bursa. In the fourth group there is a joint formation between this enlarged process and the sacrum, as a rule on one side only.

The patients are usually males, can give no history of trauma, and rarely admit any pain prior to their twenty-fifth year, probably because ossification is not complete before that time. The pain is evidently

due to compression of the soft tissues, irritation and arthritis of normal or abnormal bursæ and joints, slowly acting ligamental strain, or pressure or tension from persistent malposition of the bones of different segments of the nerve trunks.

These anomalies, which seem to facilitate the production of slight traumatic displacements with consequent sprains, cause spondylolisthesis and sometimes scoliosis. Pressure by the process on the ilium causes a direct strain, a stretching of the sacro-iliac ligaments of the same side, and subsequent sacro-iliac arthritis of both sides. The author proves that such a malformation causes pain by direct pressure because when the malformation is unilateral and there is pain over both joints, the radiated pain is over the hip, buttock, thigh, and leg of the same side, probably due to the fifth nerve between the enlarged process and the sacrum.

Scoliosis may frequently result from the asymmetry of the lumbar vertebra, the primary curvature having its convexity opposite the side of the large process. Incidentally this primary curvature may have disappeared before corrective treatment is undertaken. The malformations of the fifth and sometimes of the fourth vertebra are the result of their incomplete attempt to participate in the formation of the sacrum, the pain being due to the non-completion.

Roentgenological conclusions must not be arrived at before several plates are made from different angles. The stereoscope does not help a great deal. In cases of spondylolisthesis and backward tilting of the sacrum the lateral view is most important.

R. G. PACKARD.

SURGERY OF THE NERVOUS SYSTEM

Morton, C. A.: The Operative Findings in Thirty Cases of Gunshot Injury of Nerves, with Remarks on Diagnosis, Localization, and the Technique of Operation. *Bristol M.-Chir. J.*, 1919, xxxvi, 55.

After complete division of a nerve the ends either lie wide apart with usually a bulbous enlargement at the proximal end, or are bridged by tissue the character of which may be difficult to determine. Dissection of the fasciculi and the use of the faradic current may aid in deciding upon the presence of a nerve in the band of scar tissue. When there is marked thickening of the nerve, resection should be reserved for those which feel very hard on palpation and do not possess faradic conductivity. In the presence of a fracture the divided ends may be caught between the bones or involved in the dense scar tissue.

In incomplete lesions the nerve is usually bound down by scar tissue or flattened from pressure. A firm, fusiform or nodular enlargement is often found to contain fragments of metal. Some of these cases present early the clinical signs of a complete division

of the nerve but later improve. Others, which at first seem to be partial lesions, are found at operation to be complete. We may be misled by the absence of anæsthesia where it is expected and also by retention of power to perform some movements which we believe would be lost if there were complete division of the nerve. A knowledge of the substitution of action of a muscle or group of muscles for a paralyzed muscle or group of muscles is therefore of importance in the diagnosis of these lesions.

Operation is indicated in cases of incomplete lesions if there is no return of power or sensation after a prolonged period of electrical treatment and massage. Even when there is extensive paralysis and anæsthesia a nerve may appear normal at operation, and it must not be concluded that in all cases a marked feebleness of the group of muscles opposing the group paralyzed, even though combined with anæsthesia, indicates a complex gross lesion of the nerves. When there are several scars in the course of a nerve it may be difficult to decide at which level the nerve has been injured.

Some gunshot wounds of peripheral nerves are

accompanied by severe pain in the distribution of the nerve. In a few cases recovery has resulted without operation, while in others permanent relief has been obtained by the injection of alcohol into the nerve.

Technically, experimental work on the cadaver shows that transplantation of the ulnar nerve in front of the internal condyle does not increase the nerve length, but that merely freeing the nerve from its connective-tissue bed behind the condyle may allow considerable elongation. The relative merits of the different methods of end-to-end suture,

the advisability of surrounding the line of suture with Cargile membrane, fat, or fascia, and the value of grafting or attachment to other nerves can be decided only by observations of cases made over a very prolonged period of time. A 3-inch gap in the sciatic nerve may be repaired easily by stretching the nerve and flexing the leg on the thigh. In one case sensation returned as early as twenty-four hours after the median nerve was freed from its bed of scar-tissue.

The author appends a tabulation of the details of his series of thirty cases. E. M. MILLER.

MISCELLANEOUS

CLINICAL ENTITIES—TUMORS, ULCERS, ABSCESSSES, ETC.

Jean, G.: New Technique for the Treatment of Warm Abscesses (Techniques nouvelles dans le traitement des abcès chauds). *Arch. de méd. et pharm. nav.*, 1919, cviii, 81.

In cases of superficial or deep abscesses the large crucial incision is generally employed, but the skin is almost always altered and infected and a furrow remains due to loss of substance.

Jean recommends the paralateral incisions for the treatment of abscesses which were initiated by Chaput. Being made in healthy skin, these heal quickly and have the further advantage that at least one of them is at the lowest point of the collection and facilitates evacuation of the abscess.

In the case of a supra-aponeurotic abscess or a fixation abscess the author makes only a monolateral incision, placing it tangentially to the curve limiting the lower border of the collected mass to be evacuated. Puncture alone at the lowest point does not give sufficient drainage. After evacuation even a very large incision will often heal very rapidly. In one case an incision 22 centimeters long was healed by the fifth day.

Paralateral or bilateral incisions are used when it is necessary to explore a purulent cavity thoroughly or when the cutaneous surface involved is too extensive to be treated effectively by a monolateral incision. Such incisions are therefore usually reserved for voluminous subcutaneous abscesses, suppurating hygromata, and deep abscesses involving the muscles. They are made at the limit of the abscess, parallel to the axis of the limb or the trajectory of the nerve trunks. One of them at least should reach the lowest point of the collected mass when the patient is lying down. After they are made, the cutaneous bridge is raised up by separators, the cavity is washed out, and diseased tissues are excised. The edges of the two incisions are then sutured, a rubber or filiform drain being inserted at the lowest point.

During eight months Jean performed 110 operations of this kind. None of the treatments formerly

employed, such as counterincisions, filiform drainage, irrigation, etc., has given him as rapid and satisfactory results. W. A. BRENNAN.

Moore, B.: The Increase of Alkalinity of the Blood in Shock. *Lancet*, 1919, cxcvii, 473.

In primary shock lasting only a few minutes and resulting in cerebral anæmia and unconsciousness, the patient may recover shortly as in an ordinary faint. If, however, the condition lasts from twenty to thirty minutes, the series of events is different. The basic factor is cessation of metabolic activity to about one-third the normal rate. The lungs continue to function at their normal rate. What is the result? An excess of carbon dioxide over that produced must be removed in the lungs and the blood becomes alkaline. There need not be hyperpnoea. In the main, the condition depends upon the relative rates of the circulation and respiration.

The reason that American physiologists and chemists find a decreased alkali in the blood is that it is taken up by the tissues or removed by the kidneys or both. However, this decreased alkali in the blood determined by titration or by the Van Slyke method is not an acidosis. It is an alkalosis. The alkali in the blood is diminished but its alkalinity is increased. In shock the blood is not in equilibrium with 5 per cent carbon dioxide, but with 2 or 3 per cent. The blood of a patient in shock while within the body breathes itself into a high state of alkalinity. This high state of alkalinity reduces the output of the heart to one-fifth normal and in perfused isolated hearts stoppage results in a few minutes.

The author, who has done much work on the reaction of the blood and body tissues, calls attention to the erroneous conclusion drawn in the last twenty years in regard to this reaction.

The pioneer workers were Galleotti and Mosso who worked on the cause of mountain shock. They showed that the cause of mountain shock and sickness is the denudation of carbon dioxide in the blood due to excessive breathing to obtain sufficient oxygen. At Mosso's request, Galleotti attempted to estimate the alkalinity of the blood when shock

was tending to reappear. He did this by titrating to phenolphthalein and found the blood more acid. His titrations were correct but his conclusion profoundly wrong. Similar conclusions have been drawn for nearly twenty years since then. They have lead physicians to dose patients with sodium bicarbonate to relieve shock and to the use of intravenous injections of acid in animals in the attempt to study shock.

J. L. BUTSCH.

Plummer, W. A.: The Blood Picture in Exophthalmic Goiter. *Minnesota Med.*, 1919, ii, 330.

The author bases his report on the study of the blood counts of 578 patients with exophthalmic goiter who were examined in the Mayo Clinic during the years 1912 and 1913. The average count from the entire group is as follows:

Hæmoglobin	83.1 per cent
Erythrocytes	4,790,000
Leucocytes	6,973.5
Polymorphonuclears (relative)	58.3
Polymorphonuclears (absolute)	4,065.5
Small lymphocytes (relative)	34.8
Small lymphocytes (absolute)	2,426.7
Large lymphocytes	4.4
Transitionals	1.1
Eosinophiles	1.6
Basophiles	0.49

This tabulation shows a relative and absolute mononucleosis and a percentage decrease in polymorphonuclear neutrophiles. The hæmoglobin is below 70 per cent in only 13 cases, the lowest being 44 per cent.

In 25 cases having the lowest leucocyte count there is an increase of the relative number of lymphocytes, but the absolute count is in the range of normal. The cause of the leucopenia appears to be a decrease in the total number of polymorphonuclear neutrophiles.

In 25 cases with the highest leucocyte count the same relationship holds between the lymphocytes and the polynuclear cells as in the low leucocyte count. The difference is of less degree.

In grouping the cases from the point of onset of clinical symptoms into periods of two months, nothing characteristic is noted. There is nothing to show that the duration of symptoms bears any relationship to the degree of lymphocytosis. The lymphocyte count bears no relation to the severity of symptoms or the percentage of mortality, nor is there any relation between it and cardiac dilatation in thyroidectomy. The abnormal appetite of patients with hyperthyroidism does not alter the blood count. It would seem, however, that a relative count of small lymphocytes below 20 is of some negative value, while a count above 40 is of some positive value in the diagnosis of exophthalmic goiter.

The author agrees with Kocher in the assertion that anæmia of a chlorotic type does not occur in these cases. Kocher emphasizes the presence of a leucopenia. The results of the author's counts do

not show this. The author also noted the mononucleosis described by Kocher. When a leucopenia occurs it takes place at the expense of the neutrophiles.

J. A. H. MAGOUN, JR.

Pirie, G. R.: A Study of Hyperadrenalism: Its Influence in Producing Congenital Pyloric Hypertrophy and Subsequent Obstruction. *Lancet*, 1919, cxcvii, 513.

Congenital hypertrophic stenosis of the pylorus is explained most commonly upon the basis of a developmental defect but the evidence does not substantiate this theory. Hypertrophy may be attributed to overaction or spasm.

The purpose of this paper is to suggest that the spasm inducing the hypertrophy is due primarily to hyperadrenalism before birth, and that postnatal factors determine the recurrence or persistence of the spasm. A disturbance in the balance of the endocrine organs produces either a relative or absolute hyperadrenalism. It is not certain that the hyperadrenalism is congenital, but the evidence seems to indicate that this is true. The symptoms first appear about the third week. Moreover, the hypertrophy of the muscle found at operation is such that it does not seem probable that it is totally extra-uterine. It apparently requires more time to produce hypertrophy by spasm than many have supposed. The author concludes that in the cases studied the hypertrophy must have existed since before birth and that it was produced by a long-standing influence. The onset and severity of the symptoms are determined, not by the occurrence of hypertrophy, but by the degree of the superimposed spasm.

In view of the work of Vincent, Schafer, Elliott, Priestly, and others, it is easy to conceive of a maladjustment of the balance between the endocrine hormones at the time of birth and before birth. If a relative or absolute excess in suprarenal secretion is caused by this disturbance of balance, spasm of any non-striated muscle may result. As Keith has shown both the pylorus and the medulla of the suprarenal to be differentiated at the third month, hyperadrenalism would have sufficient time to produce hypertrophy by the time the symptoms are first noted.

Schafer's experiments showed that, in addition to pyloric spasm, injection of adrenalin produces a spasm at the ileocaecal valve and the rectosigmoid juncture. Because the recurrence or persistence of the spasm is so favored by the anatomical and secretory relations of the stomach, duodenum, and pylorus, this region is the source of more symptoms than other parts of the gastro-intestinal tract. The reason we do not see more evidence of the effects of antenatal hyperadrenalism after birth is that its degree is never constant and symptoms are produced only when it is marked. Search for an abnormal or unusual appearance of the suprarenal gland in patients who have died from stenosis and in those in which varying degrees of hypertrophy are

found at necropsy has yielded nothing. Though the process of involution may be complete, a hypersecretion may have been present before birth. The marked changes in the development and involution of the gland suggest that a disturbance of balance in its secretion might be brought about easily.

In a case recorded a suprarenal gland one-third the size of the kidney was found at the postmortem examination of a child who had had congenital hypertrophic stenosis. The œsophagus and rectosigmoid were also stenosed as was the urinary meatus.

The extent of the stenosis shows that the influence bringing it about is not local but systemic in action. Although the author does not think it justifiable to insist that hyperadrenalism is the cause of the stenosis because it cannot be proved, he believes that the explanation is reasonable.

Secretory inhibition and phimosis are mentioned as the two chief contributory causes of spasm. Three cases are cited which were symptomatically cured by circumcision. Of a series of 84 cases of congenital hypertrophic stenosis only 13 occurred in girls and not one of the patients was a Jew. It is suggested that a relation may be demonstrable between the slow involution of the suprarenal gland and phimosis.

The inhibition of secretions is directly due to the obstruction. With an already stenosed orifice, a diminished supply of pancreatic secretion is produced, and thus a vicious circle is inaugurated. After operation ordinary diet must be approached gradually as the pancreas regains its function. Experimentally hyperadrenalism has been shown to be antagonistic to the pancreas, and when both hyperadrenalism and pancreatic insufficiency are present there is sufficient cause for both the primary hypertrophy and the recurrence or persistence of the spasm.

Changes in the gastric mucosa may also be present. These in themselves are not of importance, but when associated with congenital hypertrophic stenosis, they hasten the formation of the vicious circle and the perpetuation of the obstruction.

Observations and results of treatment seem to justify the theory of hyperadrenalism as the cause of the spasm inducing the hypertrophy of congenital hypertrophic stenosis.

O. C. MELSON.

Dublin, L. I.: Mortality Statistics of Cancer among Wage Earners: with Observations on the Comparative Incidence of the Disease in the General Population. *J. Cancer Research*, 1919, iv, 235.

Although there have appeared in recent years many and important contributions to the mortality statistics of cancer, few of these have presented the facts in such detail as to show the incidence of this condition in the several age periods of life with the further distinction of sex and of color or race of the population. Such presentation is the merit of the data presented herewith. To the author's knowledge they are original in the cancer literature and should well serve the nation-wide movement for

the control of this disease. Many discussions which have centered around the cancer problem in recent years, such as the supposed increase of mortality and other questions, can be settled only when the detailed facts of mortality for a relatively constant population are known for a period of years. The present study meets this requirement admirably and has the further merit that it reflects conditions in a large industrial group among whom cancer takes a heavy toll.

Special efforts were made in the course of the inquiry reported to have the basic data as reliable as possible. When, as often occurred, physicians certifying the causes of death returned statements of cancer which were unqualified as to the organ or part affected, letters were written asking them to specify the type of tumor or cancer and the organs or parts first involved by the growth. The effect of this correspondence was to increase the precision of the statistical results. While the data were not refined to the same point of completeness as that characterizing the recent investigation of the United States Bureau of the Census, the effort was made to cover fully the various parts and organs specified in the International List of Causes of Death.

During the six-year period of this investigation, 37,666 cancer deaths were recorded at a rate of 70.0 per 100,000 persons exposed. Cancer was the sixth cause in order of numerical importance in this study. These deaths constituted 5.9 per cent of all the deaths in the experience.

Cancer and other malignant tumors of the stomach and liver constituted the largest single group of malignant growths, 37.6 per cent of all cancers, a rate of 26.3 per 100,000 persons exposed. Cancer of the female genital organs was next in importance, causing 7,882 deaths, 20.9 per cent of all cancer deaths, with a rate of 14.7 per 100,000 persons of both sexes. Cancers affecting the peritoneum, intestines, and rectum followed with 4,482 deaths, 11.9 per cent of all cancers, at a rate of 8.3 per 100,000. These death rates, however, varied considerably with age and sex.

Among other phases of the subject investigated was that of the possible relation between the incidence of cancer mortality and the economic status. This showed the main facts of an investigation based upon the comparative mortality experience of the Ordinary, Intermediate, and Industrial Departments of the Metropolitan Life Insurance Company during the three years 1914, 1915, and 1916. The lives of white persons only were included in the investigation. The Ordinary Department policy holders are drawn from higher economic strata of the population than are the intermediate group. The industrial policy-holders form the third class or group in order of material circumstance. In order to eliminate the slight effect of medical selection in the ordinary and intermediate groups with respect to cancer, the author has considered only the mortality in these classes on business in force at least five years.

As a result of an extended consideration of the data developed in the inquiry reported as to the possible relation of cancer and the economic condition, the following conclusions were drawn:

1. The current medical opinion that there is a strong association between low economic status and a low cancer death rate is in all probability unfounded.

2. The cancer mortality rate at the ages at which the cancer rate is significant decreases as we go up in the economic scale.

3. This is true for both sexes and by age period when sufficient data are available.

4. This conclusion is not conditioned by the effect of varying amounts of medical selection in the three groups considered.

Cancer death rates in the study reported, covering six calendar years and relating in all to fifty million years of life exposed to risk, show no decisive upward or downward tendency for all age classes combined. This is true for each color and sex group, but more decisively for the group of insured white females for whom the highest rates are recorded. The rates by color and by sex for the year 1911 are, to be sure, slightly lower than the figures for the entire six-year period, but this condition may be accidental and without significance. Considering all ages combined, therefore, there is no evidence presented from which an increasing mortality may be predicted with any certainty.

G. E. BEILBY.

Armstrong, G. E., and Oertel, H.: Localization of Tumor Metastases. *Am. J. M. Sc.*, 1919, clviii, 354.

While the term "metastasis" as applied to tumors is generally held to mean generalization of a growth by the formation of secondary deposits scattered throughout various tissues and organs of the body and not directly connected with each other, this is really not an all-embracing definition, for the conception of metastasis requires not only deposit but also subsequent growth of the misplaced tumor cells, with replacement of the physiological tissue by the tumor. Thus while all kinds of cells, including bacteria, may become dislodged from their original focus and arrested in different situations, a metastasis may be spoken of only when this new location is involved by disease, for the passive lodgment of foreign cells may be, and frequently is, followed by their destruction or quiescence. The appearance of foreign cells in an organ or tissue is therefore significant as a step toward metastasis, but in itself is not proof of it.

According to the authors, this important point has not received adequate consideration in the recent experimental work on the artificial production of cancer. The fact that on artificial stimulation by lipid solvents and other irritants, proliferation of cells has occurred and that some of these newly-formed cells have been disconnected and have reached neighboring tissues and even lymph glands by means of the lymph stream, is no proof of their

metastasizing quality or even true tumor character. This proof is furnished only when it can be demonstrated, not only that these cells are carried by a stream and arrested in a tissue, but also that they possess the ability to grow into a tumor and replace the physiological tissue.

The same strict interpretation of metastasis must be applied to spontaneous tumors. If on microscopic examination tumor cells are found arrested in the capillaries of the lung which they have reached by a massive break of a growth into the venous system, we are not justified in speaking of a metastasis in the lung although it is often done. In infections the evidence of the disease is the anatomical lesion. In tumor metastasis the evidence is the growth of the tumor tissue into physiological tissue and the annihilation of the latter.

This point is emphasized, not only because of the previously stated erroneous interpretation of the appearance of arrested, disconnected cells in experimental cancer production in animals, but because investigation into the problems of tumor metastasis is rendered impossible by lumping the occurrence of tumor emboli with the actual growth of tumor cells.

The general assumption that the histological picture is an almost absolute expression of the biological character of a growth is untenable for the reason that there are many tumors, such as sarcomata, congenital melanomata, spindle-cell sarcomata or endotheliomata of the dura mater, epulis, many sarcomata and cancers of the ovary, uterus, and mediastinum, sarcomata of the fascia, teratomata and the embryonic growths or remains of the gut and the appendix, which may exist for years, are often an accidental finding, and, except in rare instances, do not exhibit a tendency to infiltrate and metastasize although they may recur locally after excision.

The reverse also is true, as anatomically mature so-called benign tumors occasionally lead to secondary growths. This interesting and important fact has been emphasized by Virchow and Cohnheim.

A study of tumor metastases in a series of 98 cases of metastasizing tumors of various kinds and derivation has convinced the authors that in the localization of metastases there are two determining factors, namely, the quantity and quality of the tumor cells. For instance, in a case of small prostatic cancer, so small that only microscopic examination revealed it, practically all the organs of the body were the seat of small, nodular, multiple metastases, closely resembling miliary tubercles. Clinically the condition had been diagnosed as tuberculosis. A similar generalization is often seen in renal tumors.

In spite of the frequent metastases in the regional glands in close proximity to the tumors, it must be remembered that enlargements of the glands in the neighborhood of tumors are not always due to metastasis. Often they are inflammatory.

The relationship of the inflammatory changes to the tumor metastases is instructive and suggestive. It is not impossible that at least in a number of these cases in which infection by bacteria can be reasonably excluded the constant drain of metabolic tumor products is irritating to the gland tissue, and that by lasting injury and disturbance of the physiological tissue balance due to inflammatory changes, the organ becomes disposed to metastatic growth. If this is true, it would appear to have an important bearing on the formation of metastases for it would indicate that, under certain conditions at least, the occurrence of metastases is made possible or favored by a drain of metabolic tumor products into a tissue.

When we come to distant and often isolated metastases, however, and consider the frequency with which some organs are involved by certain types of tumors irrespective of their primary location, it is evident that other factors must enter into their formation.

In order to arrive at a knowledge of the frequency of selection of certain tissues in metastasis, an analysis of 98 cases was made by the authors. From this study it was shown that of 22 adenocarcinomata which took their origin from entoderm, 14 metastases formed in entoderm, and of 29 carcinomata which were derived from entoderm, 23 formed metastases in entoderm. Of 5 sarcomata, 5 metastases occurred in mesodermal tissue. While it is true that in these sarcomata there were also 8 metastases in entoderm organs—liver, lungs, and pancreas—the metastases in these instances were apparently not selective but due to causes previously discussed.

From this study it is concluded that the localization of metastases depends upon a number of factors. Important among these are:

1. The quantity of the tumor elements and the method of dissemination.
2. The effects of the injurious metabolic products of tumor cells upon a tissue, causing degeneration and inflammation and thereby weakening its physiological resistance.
3. The close biogenetic (embryonic) relation of tumor cells to a tissue soil whereby types of tumor cells derived from an embryonic layer grow more readily in the environment of organs or tissues derived from the same layer of the blastoderm.

G. W. HOCHREIN.

Symmers, D.: Malignant Myomata and Meckel's Diverticulum. *Ann. Surg.*, 1919, lxx, 183.

The author reports a case in which a malignant myoma was found encircling the base of Meckel's diverticulum. A review of the literature is also given.

In addition to the familiar leiomyomata of uterine origin, identical small tumors are often noted at autopsy or operation in the musculature of the stomach, intestine, gall-bladder, or elsewhere. These rarely exceed 1 centimeter in diameter and project

beneath the serous surface, sometimes into the lumen. Frequently such apparently harmless nodules undergo malignant transformation, forming malignant myomata. The case under discussion is only the sixth to be reported. Brief synopses are given of four of the others.

The author's case was that of a young man of 22. The growth, which was removed incidentally during a herniotomy, consisted of a pouch-like distal portion and a firm whitish, irregularly lobulated, proximal portion. This tumor projected also into a portion of the intestine which had been removed.

Microscopically the diverticulum showed a ground substance of connective tissue which in places was dense and hyaline and in others moderately fibrillar and richly infiltrated by small round cells with an occasional multi-nucleated foreign-body giant cell.

Examination of the lobulated areas showed the histology of a typical leiomyoma.

Microscopic preparations from the base of the tumor demonstrated the histology of a moderately cellular leiomyoma with at frequent intervals areas of polymorphous cells arranged loosely and without semblance of order. The nuclei of these cells varied in shape and chromatic richness. Multi-nucleated giant cells were fairly common. In other areas with numerous blood vessels multi-nucleated syncytial masses were detected among the tumor cells and were of such character as to indicate that they might have been separated from the vascular wall.

The author's conclusions are as follows:

1. Subserous and occasionally submucous leiomyomata are encountered in the walls of the stomach, intestine, or gall-bladder in less than 1 per cent of autopsies. As a rule they are solitary and only rarely multiple. They seldom exceed a centimeter in diameter.
2. Judging from the small number of cases of malignant myomata of the stomach, intestines, and gall-bladder to be found in the literature and comparing this with the number of subserous or submucous leiomyomata met with in corresponding situations in the routine performance of autopsies, the assumption seems reasonably justified that these apparently insignificant growths undergo transformation into malignant myomata with a degree of frequency which entitles them to attention as a potential source of danger.
3. The majority of malignant myomata of the stomach, intestine, and gall-bladder thus far reported were found in organs which otherwise appeared to be intact. In other and rare instances, however, the malignant growths bore a definite anatomical relationship to the developmental malformation of the intestine commonly known as Meckel's diverticulum.
4. The malignant myomata of the stomach, gall-bladder, and intestine, including those associated with Meckel's diverticulum, are capable not only of extensive local expansion, but of widespread metastasis. Their degree of malignancy is apparently in

excess of that of their prototype, the malignant myomata developing from smooth-muscle tumors of the uterus.

P. M. CHASE.

BLOOD

Brenizer, A. G.: Blood Transfusion: Comparison of Methods. *South. M. J.*, 1919, xii, 563.

Some of the common difficulties in blood transfusion are needling the vein of the donor and of the recipient, clotting in the needles and tubing, clotting of the blood from unexpected delay, failure of the blood to run in and out of the conveying intermediary, disjoining of the connections of the apparatus with spilling of blood, "too many fingers in the pie;" and the failure of the donor or recipient to co-operate when brought together in the dramatic setting of the operating room.

The chief methods of blood transfusion are classified by Miller as follows:

1. Direct methods by means of: (a) suture of vessels, (b) the use of cannulas inserted into the blood stream, and (c) the use of the cannula bringing intima to intima.
2. Indirect or interrupted methods: (a) by needle and syringe; and (b) by means of a receptacle or intermediary containing anticoagulant.
3. A combination of direct and indirect methods: valve and syringe.

The best and most widely used anticoagulant is sodium citrate. According to this method the blood is withdrawn into a sterile receptacle and thoroughly mixed with sodium citrate in the proportion of 1 part of a 2 per cent solution of the citrate to 10 parts of blood. This makes a 0.2 per cent solution of citrate with blood or a solution containing 1 gram of citrate in 500 cubic centimeters of blood.

In a report on the methods of transfusing blood for the recently injured offered the A.E.F. by a special committee the following conclusions were reached:

1. The method of transfusion under war conditions which should be practiced in every front hospital of the A.E.F. should be the simplest one that will give absolute satisfaction.
2. Of the available methods the citrate method has been adopted because: (a) it is the simplest with regard to technique, (b) it is the simplest with respect to equipment, and (c) it has given uniformly excellent results in a large number of cases and the presence of the citrate has resulted in no practical disadvantage.

The amount of sodium citrate used in the A.E.F. was a 0.7 per cent solution with blood, i.e., 3.5 grams with 500 cubic centimeters of blood. This amount was furnished dissolved in 10 cubic centimeters of salt solution sealed in a sterile ampoule.

The author has an ingenious device for the sodium citrate method. For the above-mentioned 10-cubic centimeter ampoule he has substituted an ampoule with a capacity of 500 cubic centimeters.

The receptacle is drawn into glass tubes or cannulas at both ends. One end is left straight and beaded so as to hold the rubber tube with the needle, while the other is looped so that the tube may be closed by the pressure of the thumb when held in the left hand and the ampoule may be suspended by a loop of bandage about the operator's neck. To this end is attached a short rubber tube with an ordinary aspiration syringe or mouth-piece. Thus prepared, 10 cubic centimeters or more of salt solution with 3.5 grams of sodium citrate are sucked into the ampoule and both of its ends are sealed in flame. The ampoule is then covered with a double layer of cloth and sterilized in a pressure autoclave. The tubing is boiled or the whole apparatus may be boiled at the time of operation.

The *modus operandi* is simple. The apparatus is assembled. The straight tube end of the ampoule is nicked with a file and a small piece broken off. The rubber tube bearing the needle is fitted on and tied with a piece of silk. A strip of bandage is looped through the curved end and the ampoule suspended from the operator's neck. The vein of the donor is needed against the stream, i.e., the needle pointing toward the hand. The upper ampoule end is then opened in a similar manner and the blood, beginning to flow, comes in contact with the citrate solution in the ampoule. The ampoule is gently agitated better to assure the mixture of the blood and citrate. If it is desirable to hasten the flow, the aspirating point is connected with the upper end.

When the ampoule is filled, the upper tube is compressed with the left hand or with a small Crile vessel clamp. The ampoule filled with blood so clamped may hang from the operator's neck or may be placed on a table without fear that the blood will flow out. The recipient's vein is needed in the direction of the blood stream.

The author closes the article with an excellent bibliography.

R. B. BETTMAN.

Polak, J. O.: A Preliminary Note on the Value of Repeated Small Blood Transfusions in the Blood-Stream Infections. *Am. J. Obst.*, 1919, lxxx, 291.

Bacteræmia and thrombophlebitis in postpartum patients have an extremely grave prognosis. About 23 per cent of the cases of bacteræmia due to the streptococcus end fatally, while only about 50 per cent of the women affected with thrombophlebitis recover. Such a prognosis justifies the trial of any rational therapeutic adjunct which may improve the results of treatment.

Infection is arrested by the development of a leucocytosis. Whether the bacteria are killed by the leucocytes or the leucocytes are destroyed by the bacteria, depends upon the supply of each. Notwithstanding the poor results reported by Linderman, Garbat, and others from the employment of blood transfusions in the treatment of postoperative septicæmia from general surgical causes, the use of

small repeated transfusions of blood offers the only plausible treatment in the blood infections under consideration. Transfusion in infection seems to serve the double purpose of lessening the secondary anæmia and supplying normally active leucocytes for temporary defense.

Early and repeated small transfusions allow the patient to immunize herself. The effect of the transfusion itself is only temporary as the blood cells thrown in are rapidly destroyed. The real value of such treatment lies in the fact that it stimulates the tissues to increased cellular proliferation. Only when the leucocytosis can be maintained is the prognosis improved.

Four cases of thrombophlebitis and seven cases of bacteræmia were treated with citrated blood with one death in each series. In those who died the condition was too far advanced. The number of colonies of bacteria per cubic centimeter in the blood of the patient with staphylococæmia was so large (500) that it is doubtful whether any treatment could have changed the outcome.

Ligation is contra-indicated in persistent bacteræmia, in confirmed septicopyæmia, and when there are uterine or juxta-uterine lesions. Hence it is evident that there is a large class of cases which are unsuited to operation and will not be benefited by it. It is in these that the field of transfusion may be extended.

Small transfusions of citrated blood are given every third day, care being taken not to use the same donor for more than two transfusions. Quantities of from 250 to 300 cubic centimeters are used and given very slowly. The transfusion is preceded by a hypodermic of $\frac{1}{2}$ grain of morphine. The author has found that this materially diminishes the severity of the reaction. Some reaction occurs, however, in 60 per cent of the cases. The blood injections should be given in the morning when the temperature is down.

Detailed blood studies made before and after each transfusion demonstrated that the leucocyte count was invariably increased and the blood pressure raised by the treatment. Temporarily the number of red cells and the hæmoglobin were also increased but rapidly decreased in the succeeding forty-eight hours. In the favorable cases the pulse always improved in quality and rate, whether the temperature exhibited any favorable change or not.

EDWARD L. CORNELL.

Unger, L. J.: The Therapeutic Aspect of Blood Transfusion. *J. Am. M. Ass.*, 1919, lxxiii, 815.

The recent wave of enthusiasm for transfusion was initiated by the introduction of simplified methods for transferring blood, the elimination of dangers, and an increasing appreciation of the therapeutic value of the procedure. Indirect methods of transfusion are of two types: those supplying whole unmodified blood (the methods of Kimpton and Brown, Lindeman, and Unger), and those which add an anticoagulant (the citrate method).

One of the differences between unmodified and citrated blood is manifested clinically by the more frequent occurrence of reactions in the use of the latter. Drinker and Brittingham state that after citrate transfusions febrile reactions occur in 60 per cent of cases and a chill in 57 per cent. In the author's series of transfusions of unmodified blood, febrile reactions occurred in about 10 per cent and a chill in about 3 per cent. The difference in the number of disagreeable reactions is due to an abnormal condition of the platelets and the red cells in the citrated blood. It has been shown that the blood platelets have become abnormal and have undergone early coagulative changes.

It has been shown also that "the mere addition of a dose of sodium citrate" to red cells induces slight abnormality as evidenced by an increased fragility and an increased tendency to hæmolyze. The corpuscles are damaged by sodium citrate which acts as a specifically harmful substance. This is of particular importance when transfusion is performed in hæmolytic diseases.

The studies reported seem to show, what *a priori* would seem to be most probable, i.e., that from a biologic point of view the delicate blood tissue must be altered in the transfusion of citrated blood. For diseases in which blood is indicated for itself, that is, when it is required as a tissue as in the various anæmias, there can be no question as to the relative merits of unmodified blood which runs almost from vessel to vessel and blood which has been handled, chemically altered, and allowed to remain for an indefinite length of time outside of the body. The transfusion of unmodified blood is the procedure of choice.

It has long been recognized that unless the donor and patient belong to the same iso-agglutinin group, iso-agglutination and isohæmolysis are possible dangers to the patient. For testing this phenomenon the methods of Moss, Lee, Rous, Turner, and Unger are the simplest and quickest.

After donors have given up blood repeatedly over a period of years there is a definite secondary anæmia which in some cases may be intense. Hæmoglobins as low as 55 per cent have been observed. Nevertheless, donors can lose large amounts providing it is distributed over a considerable period. One donor gave 50,000 cubic centimeters in six and one-half years. The blood of these donors shows poikilocytosis and anisocytosis of various degrees. In no case were nucleated reds observed. The leucocytes are increased in number, varying between 10,000 and 14,000. The differential count is about normal.

For infants the usual dose in blood transfusion is from 80 to 150 cubic centimeters; for adults, from 800 to 1,000 cubic centimeters. The amount, of course, varies with the body weight, the condition of the patient's heart and lungs, and the disease for which the transfusion is being performed.

Overtransfusion from the donor's standpoint is evidenced by an increase of the pulse and respira-

tory rates, repeated yawning, or deep sighing. Changes in the rhythm of respiration may occur before a change of the pulse rate.

In the patient, hypertransfusion may be evidenced by precordial distress, headache, backache, or pain in the legs. A more important sign, however, is a short, sharp cough. If the transfusion is continued, the cough will be repeated. The cough occurs irrespective of the rate at which the blood is transfused. If more than 200 cubic centimeters are given after the first cough, pulmonary œdema may develop and may be followed by death.

The indications for transfusion are: (1) hæmorrhage; (2) diseases of the blood; (3) toxæmias; (4) infections; (5) shock; and (6) general debility.

1. Hæmorrhage. Transfusion serves not only to replace the loss of blood but also to check actual bleeding.

2. Diseases of the blood. In secondary anæmia the results of transfusion are satisfactory, provided the primary cause is removed. In pernicious anæmia transfusion yields results superior to those obtained by any other mode of therapy. Frequently it acts as a life-saving measure by initiating the onset of a remission. There is no evidence, however, that the disease can be permanently cured in this way but by repeated transfusions remissions can be effected and the lives of some patients made useful for years.

Hæmophilia is not cured by transfusion, but for the bleeding of hæmophilia transfusion is practically a specific. It will succeed when all other methods fail.

In purpura hæmorrhagica the results of transfusion are only fairly good. Repeated transfusions are often necessary to control the bleeding.

In acute lymphatic leukæmia only a temporarily favorable effect can be secured by transfusion.

In bleeding of the new-born transfusion is a specific. An almost exsanguinated infant in a dying state is transformed immediately into a rosy and crying baby. As in hæmophilia, transfusion will save the lives of those who are not helped by subcutaneous injections of serum or blood.

3. Toxæmia. Transfusion has long been used in a limited number of types of toxæmia. It should be tried in the toxæmia of pregnancy and in toxæmias associated with pneumonia and typhoid fever.

4. Infections. In localized pyogenic infections transfusion will increase the patient's vitality and aid in overcoming the infection.

In bacteræmia when the source of the organisms can be found and eliminated the results are excellent, as in cases of sinus thrombosis following mastoiditis in which the jugular vein has been ligated.

5. Shock. Transfusion is at times valuable in shock. The nearer the transfusion approaches the advent of the shock, the more apt it is to be successful.

6. General debility. Transfusion used as a supporting measure preliminary to operations lessens the postoperative mortality.

SURGICAL DIAGNOSIS, PATHOLOGY, AND THERAPEUTICS

Wood, F. C.: *Diagnostic Incision of Tumors.* *J. Am. M. Ass.*, 1919, lxxiii, 764.

Early diagnosis is necessary in order to judge the nature and extent of the proper surgical procedure for the treatment of cancer. Correct diagnosis is often impossible without microscopic examination of the tumor.

Although fragments of tumors have long been incised for diagnostic purposes, surgeons are not agreed as to whether such incision increases the danger of metastasis. Ewing justifies biopsy if a diagnosis cannot be made otherwise, while Bainbridge, Greenough, and others condemn it.

Many cancers may be diagnosed by experienced surgeons without microscopic examination, but numerous mistakes have been made both in operating upon benign tumors too extensively as well as in neglecting malignant growths.

The author states that metastasis does not always follow exploratory incision of tumors as he has seen many malignant growths incised and even partially removed without such results. The danger of dissemination by way of the blood stream seems small as the flow of blood tends to wash particles out of the cut vessels. Furthermore, the effect of opening lymph channels has not been studied scientifically. A more frequent cause of metastasis would seem to be the handling of the tumor during both the diagnosis and the treatment, as is suggested by the frequent presence of hæmorrhagic areas on manipulated tumors and of dislodged cancer particles in the blood stream.

These facts have been brought out experimentally in mice. Tyzzer showed by a limited number of experiments on the Japanese waltzing mouse that partial excision of a carcinomatous growth does not promote metastasis.

The author experimented with the Flexner-Jobling rat carcinoma on 673 white rats which were divided into three groups. From those in Group 1 a portion of the tumor was excised aseptically and the skin then sutured over the wound. After ten to twelve days, this being the maximum time required to obtain a microscopic diagnosis, the entire tumor was carefully excised in order that the formation of metastases might be checked. The animals were killed and examined from three to four weeks later. From the second group of animals, inoculated at the same time, the tumors were removed on the same day as those in Group 1 and the animals were killed and examined from three to four weeks later. This group thus formed a check on the first, for if the number of metastases was the same in both series it would be evident that the incision of the tumors had not increased the amount of metastasis since in both series the tumors had been in the animal body for the same length of time and had been removed by the same method. Great care was taken to avoid massaging the growths. The

third group of inoculated animals was killed at the same time as those of Groups 1 and 2 and formed a check on the metastasizing power of the tumor.

In Group 1 the average percentage of metastases was 22.2; in Group 2, it was 21.8; and in Group 3 it was 32.2, the figures including metastases in the lungs and the axillary, superior mediastinal, mediastinal, and peritoneal lymph nodes.

These results demonstrate that under the given conditions in rats the metastasis of the Flexner-Jobling carcinoma is not increased when the tumor is incised, a fragment removed aseptically, and the growth allowed to remain in the body for from ten to twelve days thereafter. They permit the deduction also that tumors in the human body are not widely distributed by incision as has been thought and that therefore when the tumors are situated in such portions of the body that a mutilating or highly dangerous operation is necessary for their removal, they should be examined microscopically if a diagnosis can be made in no other way.

Control Series 3 shows that the frequency of metastasis is a function of the time that the tumor remains in the body and again emphasizes the fact that a malignant tumor should be removed as soon as the diagnosis is made.

It is preferable that such diagnosis be made immediately by frozen section if facilities are available so that, if necessary, the operation can be continued under the same anæsthesia. The patient's future is not necessarily compromised, however, if a small fragment of the tumor is removed, the wound closed, and the operation completed as soon as a microscopic examination is obtained. With modern rapid methods of preparing sections the lapse of time need not be more than three or four days.

M. H. HOBART.

Young, F. W. B.: The Treatment of Septic Wounds by Ionization. *Lancet*, 1919, cxcvii, 529.

This article is a report of cases treated at a general military hospital which demonstrate the sterilizing effect of ionization prior to delayed primary suture.

In previous laboratory experiments the author had shown that the chlorine ion is detrimental to bacterial activity. The growth of staphylococcus albus and aureus was inhibited by a short exposure to a small current. He showed experimentally also that phagocytosis is stimulated by the passage of a small current for a short time.

Chlorine was chosen because it was less apt to irritate the tissues than metal ions. The average dosage was 10 ma. for twenty minutes daily followed by a sterile saline dressing.

The wounds in six cases were sterilized prior to delayed primary suture. In four cases the results were successful, in one partially successful, and in one a failure. Twelve cases of cellulitis were treated successfully. Three cases of gunshot wounds of the extremities were treated in preparation for skin grafting, and one before a periosteal graft. In four cases of joint involvement treated the results

were completely successful in only one. The three other patients were not treated continuously because of their low vitality.

The technique was to immerse the limb or injured part when possible in a porcelain bath with a carbon electrode. The inert electrode was placed under the buttocks or strapped to an uninjured limb. If it was impossible to immerse the part, several thicknesses of lint were wrung out of 1 per cent sodium chloride solution and Carrel tubes were placed in contact with the wound and covered with lint. The electrode was fastened to the lint and by means of the tubes a fresh solution was supplied during the treatment.

The author concludes that ionization is not superior to other methods of sterilization for delayed primary suture, but that cellulitis responds well to it and the results are extremely satisfactory.

O. C. MELSON.

EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

Abel, J. J., and Kubota, S.: On the Presence of Histamine (β -iminazolyethylamine) in the Hypophysis Cerebri and Other Tissues of the Body, and Its Occurrence among the Hydrolytic Decomposition Products of Protein. *Pharmacol. & Exper. Therap.*, 1919, xiii, 243.

During the past four years investigations on the chemical and pharmacological properties of the gastric and intestinal mucosa have been in progress in the authors' laboratory. The results obtained have been described in previous papers. The so-called "peristaltic hormones" or "motilines" which European investigators have shown to be present in extracts of the intestinal mucosa and the chemical nature of which has been entirely unknown up to the present, were among the principles that first engaged attention.

The well known "Witte's peptone" so often used in the past to induce experimentally a state of collapse known as "peptone shock" has made us familiar with the fact that proteoses are either toxic in themselves, as has often been maintained, or else retain, firmly attached to themselves, smaller and highly toxic molecules which exist quite independently in the medium from which the "peptones" were obtained. The latter view is the one held by the authors and their earlier papers show that in all instances of the kind here indicated it was possible to purify a given albumose so that it no longer exhibited pharmacological activity, pressor, oxytoxic, or secretory.

The authors' main conclusions may be stated as follows:

1. Histamine, β -iminazolyethylamine, a substance which stimulates plain muscle tissue in minute doses, which depresses the circulation, and which causes a shock-like prostration when administered in doses beyond the limits of toleration, is a widely distributed constituent of all animal tissues,

organ extracts, and enzymatic products, such as Witte's peptone and erepton, whether derived from animal or vegetable proteids. While, as is well known, certain bacteria are capable of producing the base by decarboxylating histamine, its occurrence as here described is entirely independent of micro-organisms. Hydrolysis of pure proteins, such as crystallized albumin, pure casein, and edestin, with hydrochloric acid yields a base which, in the authors' opinion, is identical with histamine or at best is a similarly acting substitution product of it.

2. It follows from the above that histamine is a constituent of our diet and that we daily consume no inconsiderable amount of the base, some of which is present in the form of the free base or a simple salt, while more of it is in all probability produced in the course of digestion. The latter assertion is based on the fact that enzymatic products, such as Witte's peptone and erepton, contain the base in larger amount than the original material from which these products are derived.

3. Histamine plays an important rôle as a stimulant of the gastric and intestinal musculature and also as a dilator of capillaries during digestion. This last action is probably of importance also as regards organs in general during periods of increased activity. It has been further suggested that histamine is the most powerful among the depressant substances which have their origin in mutilated tissues and hence plays the leading rôle among the chemical factors concerned in traumatic shock.

4. Histamine is the plain muscle-stimulating and depressor constituent of the posterior lobe of the pituitary gland. The physiological and chemical evidence in favor of the identity of the two principles coincide at every point. As histamine occurs to some extent in all tissues, it can no longer be considered a hormone or substance specific to the pituitary gland. There is no explanation to offer at present for the relatively high concentration in which the base is found in the posterior lobe of this organ.

5. The animal organism can tolerate considerable amounts of histamine when it is given by mouth.

G. E. BEILBY.

Wegeforth, P., and Essick, C. R.: *The Effect of Subarachnoid Injections of Antiseptics upon the Central Nervous System.* *J. Pharmacol. & Exper. Therap.*, 1919, xiii, 335.

Subarachnoid injections of antiseptics have been advocated by Franca and Wolff as a means of combating infection of the subarachnoid space. The use of such chemicals was advised not only in the meningococcic infections in which specific therapy is of utmost service but also in the other types of infection for which serum treatment has not yet been developed.

Time has not permitted the investigation of as large a series of these agents as desired, nor have sufficient experiments been completed with some of the antiseptics used. A method of irrigation similar

in part to that first devised by Leonard Hill was employed to test the initial toxicity of some of the solutions and promises much in the pharmacological investigation of the subarachnoid space. Certain phases of this work have been so significant in result as to justify generalizations regarding the subarachnoid injection of antiseptics for it is apparent that chemical bodies applied directly to the central nervous system have a much greater initial toxicity than when applied elsewhere. Microscopic examination of the central nervous system reveals in these cases anatomical changes which persist after the toxicity of the antiseptic has subsided.

Although the early experiments with fairly high dilutions killed the animals, the results were not unexpected and the fact that eventually a point in dilution could be reached at which the bactericidal qualities of the solution were preserved and the toxicity for the animals lost, indicated that such injections might have a therapeutic value. However, an investigation of the pathology of the central nervous system of the animals which were apparently unaffected clinically by the drug made it imperative to study the problem from a different point of view, namely, the ultimate pathologic changes. Accordingly, subarachnoid injections of small amounts of chloramine in Ringer's solution were made and the cerebrospinal fluid examined each day thereafter. Within twenty-four hours after such an injection, the number of white blood-cells and the globulin content of the fluid showed enormous increases. From this maximum at twenty-four hours a gradual decrease in cell count and globulin occurred, a normal being reached about the fifth or sixth day. However, with the decrease in the abnormality of cerebrospinal fluid, the condition of the animal did not improve but became progressively worse.

The protocol of a typical experiment of this kind in which a subarachnoid injection of a 1 per cent solution of chloramine was made by lumbar needle showed the return to normal of the cerebrospinal fluid as judged by cell count and globulin but clinically the animal did not improve.

The authors summarize the article as follows:

The toxicity of certain antiseptics within the meninges has been tested and the results recorded in detail. Most of the chemical bodies employed possessed definite toxicity so that unless given in suitable dilution and amount, the death of the animal ensued. With chloramine and flavine, a secondary cause of death in five to ten days in addition to the initial toxicity was brought about through direct injury to the central nervous system. Following the injection of small amounts of a suitable dilution the animals remained apparently normal but all showed at autopsy pathologic changes in the meninges.

The lesion consisted of a more or less complete obliteration of the meningeal (subdural and subarachnoid) spaces with serofibrinous exudate; in the more severe cases the nervous system became

involved in a process of destruction by a direct continuity from the meninges. The blocking-off of the subarachnoid space was complete in only one case, as demonstrated by the subsequent injection of ink. It was not sufficient, however, for the localization of the infection. The subarachnoid injection of lysol and potassium permanganate in the presence of an otherwise fatal meningeal infection did not prolong life.

G. E. BEILBY.

Wolf, C. G. L.: The Biochemistry of Pathogenic Anaerobes. VII. *Bacillus Proteus*. *J. Path. & Bacteriol.*, 1919, xxii, 289.

The organisms included under the name of *Bacillus proteus* do not belong strictly to the pathogenic anaerobes. They are so closely associated with the principal agents in gas gangrene infection of wounds, however, that any examination of the biochemistry of symbiotic growth must be preceded by an investigation of the chemical activities of these micro-organisms.

The possible significance of *Bacillus proteus* in wound infections is very great for under modern war conditions many wounds are infected with it. With an organism so widespread and utilized by investigators so often as an object of research, it is remarkable that no real agreement has been reached regarding some fundamental notions as to its metabolism.

The characteristics which have been given of this group are fairly clear and the organisms found in wound infections correspond to the definition. Jordan defines *Bacillus proteus* as a motile organism fermenting glucose and saccharose, rarely lactose. It is for the most part vigorously proteolytic, liquefying gelatin and blood serum. It precipitates and then dissolves casein. *Proteus vulgaris* is a gas producer. Lactose is never attacked. In glucose broth it always produces less CO_2 than H_2 .

The results in the present paper were obtained with strains of *Bacillus proteus* isolated from wounds by Douglas and M'Intosh. The strains provided by Douglas gave group agglutination reactions in common. As a control, transfers were returned to him at the conclusion of the work and he reported that the strains had not changed in their group reactions during the time they were out of his possession. The strains of *proteus* obtained from M'Intosh were submitted to the agglutination tests of the Douglas serum and it was found that they too were of the same type.

The organisms used were thirteen strains obtained from Douglas and three from M'Intosh. They corresponded to the definition of *proteus* given by Jordan in that they fermented glucose and saccharose and rarely lactose. They precipitated and partly dissolved casein, and were motile. They were all Gram-negative.

The strains "Rothwell" and "Scougall" from the Douglas series were selected arbitrarily, assurance having been given by him that the cultural characteristics of the various strains were very

similar. The strain used from M'Intosh's series was also taken at random.

The results of these experiments are summarized by the author as follows:

Bacillus proteus grown upon various media does not exhibit any of the qualities of a putrefactive organism. It is a moderate gas former, the largest amount of gas being obtained in cultures of cooked meat. Compared with putrefactive organisms, such as *Bacillus sporogenes* and *Bacillus histolyticus*, its proteolytic activities are not great.

The two strains examined attacked lactose. The analytical result gave a lactose consumption of 69 grams per liter.

The volatile acid production was very small. In none of the experiments was any putrefactive smell noticeable, and no indol was produced under the most favorable circumstances for its development. *Bacillus proteus* contains a powerful urea-splitting ferment, being capable of transforming 45 per cent of the total nitrogen of urine into ammonia.

G. E. BEILBY.

Dochez, A. R., Avery, O. T., and Lancefield, R. C.: Studies on the Biology of the *Streptococcus*. *J. Exper. M.*, 1919, xxx, 179.

The complete biological classification of any pathogenic micro-organism presents a very complex problem. The first phase of the undertaking concerns itself with the development of reliable methods for the determination of antigenic differences between members of the species and the application of these methods to the discovery of the immunological relationships between a limited number of strains purposely selected. In this way the degree of similarity and diversity of type is shown and also the probable number of types and the proportion of classifiable to unclassifiable strains. The next step of necessity is the testing of the adequacy and universality of the information so gained by applying the tentative classification to a large number of strains of the organism obtained under what may be described as normal conditions of pathogenicity.

That some sort of equilibrium has been established in nature among micro-organisms that have produced disease over long periods of time is not unlikely. Indeed, evidence obtained from the study of pneumococci supports this view, although departure from the norm may occur under special conditions. After the relationship of the pathogens of the species to one another has been discovered, it then becomes important for the purposes of an epidemiological study to compare the pathogenic with the saprophytic varieties by the same methods. This task requires years for its completion and many difficulties and seemingly unexplainable phenomena are encountered. In the beginning, the broader lines of differentiation must be drawn and divergent results discarded for the time being since, if the original conception is correct, most of the discrepancies disappear with the advance of knowledge.

In this paper are presented the facts so far obtained in the present study of streptococcus hæmolyticus in accordance with the plan outlined above. The strains were collected in a limited community during the course of what may be considered an epidemic of bronchopneumonia secondary to measles. Individuals from all parts of the United States, however, were passing rapidly through this community which was a center for primary training of the aviation service, so that a wider range of territory is represented than the immediate community itself.

All strains were investigated as to their cultural reactions, bile solubility, capacity to hæmolyze red blood cells and ferment the different test sugars, and as to the hydrogen-ion concentration limiting their growth, and thus identified as accurately as possible as streptococcus hæmolyticus of the human type.

This work has cleared up a number of points which have been in dispute for many years. In the first place, streptococcus hæmolyticus of human origin is not a unit type as was previously supposed, but probably consists of a number of types, at least four of which have been definitely identified. Previous investigators have stated that freshly isolated human strains change their antigenic properties on animal passage, and that the latter procedure for the development of animal virulence gives a common antigenic character to all strains. The authors have found no evidence to support this contention; in fact, immune sera produced with human strains that have never been passed through animals afford a high degree of protection against strains that have received many animal passages. In addition, the antigenic differences between strains of streptococcus hæmolyticus which have been passed through animals are as distinct as those between strains which have not been so passed. The types of streptococcus hæmolyticus studied were obtained almost exclusively from the respiratory tract and from a limited source of supply, and there is some reason to believe that those which produce cellulitis, erysipelas, and septicæmia may be of somewhat different character. It is readily seen, therefore, that only a beginning has been made in the classification of streptococcus hæmolyticus and that before the classification is complete and the relative dominance of the different pathogenic varieties is determined, much work remains to be done.

The results of the study are summarized as follows:

1. Immunological differences have been shown to exist between strains of streptococcus hæmolyticus of the human type.
2. Four biological types were identified by means of the reactions of agglutination and protection.
3. At least two other types were encountered and the indications are that more exist.

G. E. BEILBY.

Luden, G.: The Value of Blood-Cholesterol Determinations and Their Place in Cancer Research.
J. Lab. & Clin. Med., 1919, iv, 719.

Following a discussion of: (1) the nature of the test for cholesterol; (2) the importance of a uniform method for cholesterol determinations (3) the source of the cholesterol intake; (4) the facts that influence the blood cholesterol; and (5) the practical results to be expected in cancer research from the study of cholesterol metabolism, the author summarizes her work as follows:

1. The test for cholesterol is not a diagnostic test, but furnishes information concerning cholesterol metabolism; it will therefore furnish information regarding the disturbances of cholesterol metabolism connected, for instance, with cholelithiasis and carcinoma.

2. Cholesterol metabolism is influenced by the rate of basal metabolism; in myxœdema it was found to be inversely proportional to the basal metabolism.

3. The reaction for cholesterol is a purely chemical reaction and technical procedures play a prominent part in the results obtained. Consequently the method of extraction and the conditions under which the color reaction takes place determine the values of blood cholesterol found.

4. In clinical work intended to promote our knowledge concerning the relation between the cholesterol content of the blood and pathologic conditions, a uniform method of procedure should be adopted for cholesterol determinations since this alone will insure comparable findings. A detailed account of the technique used in the determinations is given as this technique is based on the determination of more than 1,500 blood samples, which made possible the recognition and elimination of many elements of error in the work.

5. The cholesterol content of the blood is influenced by a number of factors: the nature of the diet, the rate of basal metabolism, radium treatment, bacterial infection (ulceration, infectious disease), and hæmorrhage. These factors should be duly considered in the clinical interpretation of blood-cholesterol values. The cholesterol content of the blood is intimately related to lipid metabolism and can be influenced by dietetic measures.

6. It is known that the inefficiency of an individual organ may give rise to a particular type of metabolic disturbance; inefficiency of the thyroid results in myxœdema, pancreatic inefficiency in diabetes.

7. There can be little doubt that there is an intimate relation between disturbances of the cholesterol metabolism and the lawless proliferation of cells observed in carcinoma, although it is not yet known what organ is initially responsible for these disturbances.

8. The results obtained in the treatment of diabetes show what may be achieved in spite of organic inefficiency. These results have been obtained by means of chemical investigations and by

dietetic measures calculated to counterbalance the inefficiency of the pancreas. The histologic study of the pancreas, on the other hand, did not materially advance our knowledge in the treatment of the disease.

9. The fact that in a number of carefully controlled cases the tumors receded and the patients became clinically well although their condition had been pronounced hopeless, constitutes proof positive that the human body may wage a successful battle against malignant disease.

INDUSTRIAL SURGERY

Hopkins, C. W.: A Study of Traumatic Hernia, So-Called, among Railroad Employees. *Mod. Med.*, 1919, i, 389.

So many unjust claims are allowed against the railroads under present conditions, that the law should take cognizance of the fact that hernia (indirect inguinal hernia) results from a developmental defect and that accidental injury can be made only a secondary cause. Over 90 per cent of the claims for traumatic hernia are filed by men not previously examined. The only protection possible for the railroads at the present time is the routine examination of all employees in order to obtain a record of their physical condition at the time of employment. If a rational interpretation of the traumatic hernia question cannot be made, workmen with an inherent inguinal defect should be excluded from certain industries.

Even when symptoms are present on only one side, Hopkins usually performs a bilateral operation as, potentially at least, the condition is very apt to be bilateral. Many of the cases of alleged traumatic hernia operated upon within forty-eight hours of the supposed injury show no extravasation of blood or serum and not the slightest laceration of the tissues—merely the well-known picture of weak abdominal musculature, almost no conjoined tendon, and a well-formed sac.

R. B. BETTMAN.

HOSPITAL, MEDICOLEGAL, AND MEDICAL EDUCATION

Valid Law—Meaning of the Word "Medicine"—Neuropathy. *Commonwealth vs. Siebert (Pa.)*, 105 *Atl. R.*, p. 507.

According to the statute of Pennsylvania it is unlawful for any person to engage in the practice of medicine and surgery or to hold himself forth as a practitioner in medicine and surgery or to assume the title of doctor of medicine and surgery or doctor of any specific disease or to diagnose diseases or to treat diseases by the use of medicines and surgery unless he has first fulfilled the requirements of this act and has received a certificate of licensure from the bureau.

Of great importance in this connection is the interpretation of the word "medicine." The Supreme Court of Pennsylvania stated that the term

indicates nothing more than a remedial agent which has the property of curing or mitigating diseases, or is used for that purpose. Another meaning indicates an art of healing or science which has for its province the treatment of diseases generally. In the first definition medicine is defined as a drug and in the second as a profession. The statute uses the word in the latter sense because the purpose of the statute is not to restrict the sale of drugs or other remedial agents but to restrict the practice of medicine as an art or science whose object is the preservation of health.

The defendant in the case reviewed, J. A. Seibert, held himself out to the public as a neuropath and invited the confidence of the public generally by the sign exposed in front of his office citing him as "Dr. J. A. Seibert, Neuropath." The defendant appeared to make a distinction between neuropathy and medicine but the Court, having in mind the legislative meaning of the term "medicine," held that a practitioner of neuropathy was the meaning of the above quotation for the use of this term necessarily implied that he was skilled in the science of pathology which science has for its province the treatment of diseases.

J. A. CASTAGNINO.

Duty to Provide Prompt Emergency Treatment. *Fontanella vs. New York Central Railroad Company*, (N. Y.), 174 *N. Y. Supp.* p. 537.

The plaintiff, a foreman in the employ of the defendant, while working in a manhole was injured at about 9:30 a.m. by the cover of the manhole which fell upon him and broke his leg. He was taken to an emergency hospital which he reached about 10 o'clock but was not given treatment until a few minutes before 11 o'clock. Testimony further showed that the assistant station master had attempted to reach one of the company's physicians and, failing this, had then tried to get another in the company's employ. There was some controversy as to why the physician did not arrive prior to 11 o'clock. According to the testimony, infection sets in immediately in a wound of the kind under consideration and therefore it requires immediate attention; a delay of minutes may permit the development of the infection to such an extent that amputation may become necessary.

Immediately after the emergency treatment at one hospital by one surgeon the patient was taken in an ambulance to another hospital. The jury found upon the evidence, and the court stated on what it deemed was sufficient evidence, that the delay of approximately an hour at the emergency hospital permitted the infection to develop to such an extent that it became necessary to amputate the leg; that the defendant had not used reasonable care in providing prompt emergency treatment.

The trial judge held that the defendant railroad company was not liable for the negligence of the first physician in failing to get to the hospital. The liability found by the court was placed on the negligence of the assistant station master for failing to

provide emergency treatment for over an hour. A corporation must always act through its agents and when prompt service may be vital to the welfare of the injured person it is incumbent upon the institution to use reasonable diligence in providing emergency treatment. This is a non-delegated duty on the part of the railroad company, and the defendant was properly held responsible for the negligence of the assistant station master.

The judgment in the Trial Court was for \$20,000 damages but this was reduced by the Court of Appeals to \$12,000. The action was not brought for the original injury but was predicated upon the negligence of the defendant company as above stated.

J. A. CASTAGNINO.

Evidence and Instructions in Malpractice Case.

Dameron vs. Ansbro (Cal.), 178 Pac. R., p. 874.

The case of *Dameron vs. Ansbro* was a suit brought by a physician for professional services and a hospital bill in which the defendant filed a set off claiming malpractice. The case was predicated upon the following facts which were shown by the evidence.

The defendant was injured in a train wreck and at his request was taken to the plaintiff's hospital. He suffered ten fractures of the legs and arms. He claimed that after nearly ten weeks of successful treatment, the attending physician, while attempting to reduce adhesions in the knees, negligently rebroke some of the original fractures. The Court held that the plaintiff was entitled to recover the reasonable value of the use of the room and of board and nurse hire irrespective of the question of the skill used by the physician in the treatment and that in its opinion the verdict ought to have been for the plaintiff physician.

The Court held that it was error to give the jury an instruction which completely ignored the test by which a physician charged with malpractice should be judged; that is, the test fixed by the law based on the methods and practice of the school to which the physician belongs. It held also that the instruction further permitted the jury to apply its own standard of care or that of each individual juror to the treatment given the defendant.

In the opinion of the Court only an expert could properly testify to the nature of the treatment required and to the amount of force that might be exercised to break such adhesions as existed in this case, but that the instruction proposed was faulty as implying that only an expert could testify as to the amount of force that actually was used and the method of treatment that was actually employed. If there had been no dispute as to the facts, it would have been a question solely for experts. It was not an error, however, to refuse the instructions because there was a conflict as to the facts.

The Court then discussed the latitude allowed in the choice of facts forming the basis of hypothetical questions, stating that if the question is fair and understandable by the witness it is not to be ex-

cluded because it does not include all the important facts in the case. If objection is made to hypothetical questions, the objection should be specific, stating the facts upon which it is based.

Statements by the attending physician at the time of the treatment are proper and may be included in a hypothetical question but not statements of assisting physicians.

The question as to whether it was an error to refuse to allow the plaintiff to introduce a human skeleton for the purpose of illustrating his testimony is a matter for the decision of the Trial Court.

Evidence that the plaintiff was a member of a county medical association was not admissible for the purpose of showing that the association protected any member in litigations of this kind.

J. A. CASTAGNINO.

Physician Not Liable for Testifying to Insanity.

Corcoran vs. Jerrel (Iowa), 170 N. W. R. p. 776.

The case of *Corcoran vs. Jerrel* was a suit brought against a physician for libel because he had testified that in his judgment the plaintiff was insane and should be sent to a hospital for treatment. The defendant, who had been previously employed as the plaintiff's physician, was subpoenaed, sworn, and examined before the commissioners on the trial. His testimony was reduced to writing and signed by him. On the following day the plaintiff was taken by the sheriff to the hospital from which she was later paroled and finally discharged as cured. Plaintiff's petition demanded damages in large sum, alleging that the statements signed by the defendant before the commissioners were false, malicious, and libelous.

The principal defense relied upon by the attorney for the defendant was that the statements complained of were made by the defendant as a witness under oath and therefore privileged. The plaintiff sought to avoid the plea of privilege on the ground that no notice of these proceedings was served upon her. The Iowa statute, however, does not require notice of the filing of an information alleging insanity to be served upon the person whose mental condition is being investigated. There was nothing in the record to show that the defendant was actuated by improper motives or that he acted in bad faith toward the plaintiff. He was subpoenaed, sworn, and examined on oath and therefore his testimony was equally privileged. Whether an action for libel could be maintained against him if the proceedings before the commissioners had been invalid was not a question before this court. So far as the record disclosed, the proceedings before the commissioners were regular and valid and all of the statements made by the plaintiff were clearly privileged.

J. A. CASTAGNINO.

The Relative Value of Medical Expert Testimony.

People vs. Harvey (Ill.), 122 N. E., p. 138.

In the case of the *people vs. Harvey*, the defendant was convicted of manslaughter by assault. The

principal controversy was whether the death was the result of the assault or of disease. One of the points raised by the defendant's counsel was that the Court erred in refusing to give the following instructions:

"The Court has allowed in this case the introduction of expert testimony as to the cause of the death of Ida Murray. The Court instructs you that the opinions expressed by such witnesses are not binding or conclusive upon you. It is for you to determine from all the facts and circumstances in the case what, in fact, was the cause of the death of Ida Murray, and you are not to act upon expert opinions to the entire exclusion of other testimony."

The Supreme Court in holding that this instruction was properly refused stated that it tended to cast discredit upon expert testimony and that there could be no question that the weight to be given expert testimony is to be determined by the jury. There is no rule of law which requires them to surrender their judgment or to give a controlling influence to the opinions of scientific witnesses. When several competent experts concur in their opinion and no expert evidence is introduced tending to prove the contrary, the jury are still bound to decide the issue on the basis of their own judgment assisted by the testimony of the experts. Expert testimony must be treated as the evidence of lay witnesses. It must not be rejected arbitrarily. Jurors are to concede to it the influence which, according to their intelligence and impartiality of mind and in view of all the facts and circumstances developed at the trial and the common knowledge and experience of mankind, they deem justifiable. When common knowledge utterly fails, expert opinion may become controlling.

The Court held that the relative weight given to medical and non-medical witnesses cannot be determined by any rule of law although the strong presumption would be that when both classes of experts are given the same opportunities for observation, the testimony of medical experts would be entitled to the greater weight.

J. A. CASTAGNINO.

Release to Company No Defense to Surgeon Forgetting Identity of Patient. *Purchase vs. Seelye (Mass.), 121 N. E. R., p. 413.*

The Supreme Court of Massachusetts reviewed the case which was based upon an action brought to recover for an operation without consent which resulted in a verdict for the defendant. A release to a railroad company was introduced in evidence, the Review Court sustaining exceptions to this admission and to the rule that the release by the plaintiff to the railroad company was a bar to this action.

While in the employ of the railroad company, the plaintiff suffered a rupture in the right groin. He consulted the defendant who operated upon him the following day. The day subsequent to the operation the plaintiff discovered that the operation had been performed on his left side, and when mentioning this fact to the defendant, the defendant said that

he (the defendant) had mistaken him for another patient who had a hernia on the left side. Subsequently an operation was performed by the defendant on the plaintiff's right side.

Later the plaintiff settled his claim against the railroad company, signing a release which included among other things a release of all claims and demands "arising or which may arise out of said injury." This release was claimed by the defendant herein to be a bar to further action.

The Court of Appeals, however, held that if in an action brought against it to recover for the original injury, the plaintiff's employer would have been liable for the negligence of the defendant in the case at bar, then the release included such damages and would be a bar to the present action for the reason that the plaintiff had a claim against both the defendant and the railroad company for the same cause of action and a release of one of the wrongdoers would operate as a release of both.

It is a well-settled rule in Massachusetts that in an action for personal injuries arising out of the alleged negligence of the defendant, the plaintiff is entitled to recover for the injuries resulting from the defendant's negligence even though such injuries are aggravated by the defendant's physician if, in the selection and employment thereof, the plaintiff exercised due and reasonable care.

The question was whether the act of the defendant in operating by mistake on the plaintiff was a natural and probable result of the negligence of the railroad company. The Court was of the opinion that the general rule as above stated was not applicable to the state at bar.

There was sufficient evidence to show that the defendant made a mistake in the identity of the plaintiff at the time the operation was performed; that he then believed he was operating upon another patient who had a hernia on the left side. The railroad company could not be held liable for his mistake and belief. Such a mistake was not an act of negligence which could be held or found to be the natural and probable result of the original injury.

The Court was of the opinion that the act of the defendant in operating upon the wrong side of the plaintiff was a wrongful, independent, and intervening cause for which the original wrongdoer was in no way responsible. In order to hold that the release was faulty and a bar to the attending physician it would be necessary for the Court also to hold that the railroad company would have been liable for the consequences of the plaintiff's injury through the mistake of the defendant for operating upon the wrong side of the plaintiff.

J. A. CASTAGNINO.

Result of Original Injury. *Med. Rec., 1919, xcvi, 548.*

The Michigan Supreme Court held in a recent decision that the State Accident Fund was not entitled to be relieved from the weekly payment of indemnity on the ground that the disability was

caused by unskilful treatment or by refusal to submit to an operation on the part of the injured servant. In the case under consideration one physician testified that in his opinion the applicant was totally disabled, the disability being due largely to the original injury. In his opinion, even if the physician who had treated the arm had done the best that could be done under the circumstances, that is, had used the care of a skilled practitioner, there might still be total disability of the arm.

According to other medical testimony, however, it appeared that an operation would ameliorate the condition and that the servant might recover from one-fourth to one-half of the former use of the arm. The Court eliminated the question of fact and stated that when there is competent testimony supporting the conclusions reached by the Industrial Accident Board it affirms the order of that board.

J. A. CASTAGNINO.

MILITARY SURGERY

Bevan, A. D.: The Problem of Hospital Organization with Special Reference to the Co-ordination of General Surgery and the Surgical Specialties. *Mil. Surgeon*, 1919, xlv, 150.

To secure the best co-operation between general surgery and the surgical specialties, hospital organization and administration should be as follows:

1. We should adopt the plan of utilizing the services of both our general surgeons and our surgical specialists.

2. The scheme of organization and administration of the various surgical divisions in military hospitals should be along accepted lines as in our best civil hospitals.

3. In the hospitals close to the line, including casualty and base hospitals which will have the early management of the gross injuries from shell wounds and small-caliber bullets, the organization should be so planned that the general surgeons will have charge of these gross injuries irrespective of their anatomical location, and the few surgical specialists on the staff of these hospitals will do such work as is assigned to them by the surgeon in charge.

4. Well back of the line there should be developed special hospitals, such as orthopedic hospitals, hospitals for head surgery, special fracture hospitals, etc. In these special institutions the surgical staff should be so organized that the specialists will have complete control of the management of the cases. There should be on the staff a few men representing special fields, such as internal medicine, neurology, ophthalmology, etc., and these men should do such work as they may be called upon to do by the staff of specialists in charge of the hospital.

5. The effort made to establish schools in special departments giving special instruction in surgery of the brain, fractures, orthopedics, etc., should be continued and amplified as much as possible. These schools should be devoted to special fields of surgery and should give short courses reviewing the work

of a special field, especially from the standpoint of the experience obtained in the recent war. They should not attempt the impossible task of creating specialists in these particular fields in a short period, but should be regarded as furnishing courses of instruction to general surgeons which will make them more competent in such special fields of work.

6. The specialists in charge of the special hospitals to be created well back of the line should be drawn, not from the students taking these special courses, but from the well-trained specialists now available.

E. C. ROBITSHEK.

Manson, F. M.: Report of Surgical Service, U. S. Army Base Hospital, Camp Dodge, Iowa, on the Epidemic of Influenza of 1918. *Am. J. M. Sc.*, 1919, clviii, 244.

The total number of cases of empyema recognized by antemortem aspiration and by autopsy at this camp from Sept. 29, 1918, to Dec. 31, 1918, exclusive of a period of eleven days at the height of the epidemic when autopsies were discontinued, was 150, an incidence compared to that of pneumonia as 1 is to 13.

Other complications encountered were as follows: mastoiditis, 14; otitis media, 105; frontal sinusitis, 1; purulent peritonitis, 4; appendicitis (ruptured), 2; multiple abscesses, 4; phlegmon of neck, 1; phlegmon of chest, 1; ileus (mechanical), 1; and oedema of the glottis, 1.

The average time intervening between the diagnosis of pneumonia and empyema in 64 cases treated in the first month of the epidemic was six days, while that in 41 cases treated after the first month was twenty-one days. Many patients admitted to the hospital with a diagnosis of pneumonia showed pleural effusion present at the time of admission.

The bacteriology of the cases treated was as follows: fluids showing hæmostreptococci, 29; hæmostreptococci with other organisms, 19; non-hæmolytic streptococci, 4; non-hæmolytic streptococci with others, 3; staphylococci, 4; staphylococci with other organisms, 6; pneumococci, 11; pneumococci with others, 9; influenza bacilli, 1; no growth, 6; no report, 14.

In the cases of the first month the clinical picture was that of septicæmia. The rapidity with which fluid accumulated was remarkable.

The mortality in 94 cases during the first month was 70 per cent, while that in the 64 treated cases was 56 per cent. The mortality after the first month was 40 per cent and in 41 cases treated during this period it was 24 per cent.

The diagnosis of empyema was often difficult, the physical signs being confusing and changing rapidly.

Substernal pus pockets and purulent mediastinitis were found in 17 per cent of cases at autopsy and were seldom diagnosed before death. Interlobar empyema occurred in 8 per cent of cases, encapsulated pockets in 28 cases, and lung abscess in 11.

The treatment in this series consisted of the use of several methods. During October when the

epidemic was at its height aspirations were done in 35 cases, with a mortality of 60 per cent. Aspiration followed by the injection of 2 per cent formalin in glycerin was done in 43 cases with a mortality of 42 per cent. Aspiration with later Brewer-tube drainage was used in 25 cases and the mortality was 24 per cent.

After November 1 the closed method was used with trocar-cannula thoracotomy, irrigation with Dakin's solution, and later injection of 2 per cent formalin in glycerin. Nineteen of these patients had preliminary aspirations. The mortality was 8 per cent.

V. P. DIEDERICH.

Taylor, G.: On Abdominothoracic Wounds of Warfare. *British M. J.*, 1919, ii, 131.

The author reviews his own experience and that of his associates in the treatment of wounds involving both the thorax and abdomen. In this connection mention is made of the fact that in 1910 he observed Bland-Sutton carry out an operation which was the prototype of the procedure re-introduced by Duval in 1917 and found to be so efficient in dealing with wounds of this kind.

The prompt treatment of all such wounds apparently accounts for the great improvement in the results obtained during the closing months of the war, and to Lockwood is due much credit for his part in the development of this class of surgery.

As regards the necessity for immediate suture of the diaphragm, Taylor states that in several instances, and especially on the right side, the dia-

phragm has been deliberately left unsutured with favorable results. Statistics show that the immediate prognosis of abdominothoracic wounds is determined chiefly by the nature of the abdominal injury. Those that are associated with a wound of a hollow viscus are often fatal. In the author's personal experience with cases of this kind submitted to operation 50 per cent of those who had an injury to a hollow viscus recovered, while of those who had wounds of a solid viscus 70 per cent recovered. The total number of recoveries amounted to 64 per cent.

Cases operated upon by the author and by others are cited to demonstrate the accomplishments of war surgery. A patient with a penetrating chest wound, laceration of the diaphragm, liver, and right kidney, and a hernia of the colon was operated upon by Lockwood six hours after admission. Thoracotomy under paravertebral and local anæsthesia was done with excision of the tissues of the wounds of entry and exit, resection of a gangrenous portion of the colon, suture of the laceration of the diaphragm (which was 5 inches long and $\frac{1}{4}$ inch from the parietal attachment), and nephrectomy. The patient had an uneventful recovery. Other cases cited were those in which there were wounds of the stomach and those in which, with injuries of the chest, the spleen was so lacerated as to require its removal.

The point which the author makes as regards the choice of operation in diaphragmatic hernia is that the thoracic route is by far the best method of approach.

W. J. TUCKER.

GYNECOLOGY

UTERUS

Young, J. V.: Sacral Suspension of the Uterus for the Relief of Pathologic Mechanical Retroversion and Descensus. *Surg., Gynec. & Obst.*, 1919, xxix, 267.

The author gives a general review of the causes of mechanical retroversion and descensus. He summarizes his conception of the indicated surgery as follows:

"In nullipara, for physiological retroversion, round ligament shortening; for pathologic mechanical retroversion and descensus, sacral suspension and, if needed, round ligament shortening; when there is a conical long cervix, the tracheloplastic operation of Sturmdorf.

"In multipara, the restoration of all birth trauma; dilatation and curettage if indicated; for the hypertrophied infected lacerated cervix, the tracheloplastic operation for cystocele, the restoration of the vesicovaginal endopelvic fascia by the method of Rawls; for rectocele, the restoration of the rectovaginal endopelvic fascia, and the muscular interposition perineorrhaphy."

The operation for sacral suspension is described as follows:

The incision of choice is the curved Pfannenstiel incision. After the abdomen is opened, the patient is placed in the extreme Trendelenburg position and the intestines are gravitated into the abdominal cavity and held in place by oil-impregnated pads. All gauze wipes that enter the abdomen are also oil-impregnated.

Inspection then determines the indicated surgery which is performed prior to the suspension. At this point the uterus is lifted up and the sigmoid is inspected. In these cases the author has so frequently found perisigmoid adhesions that he has come to consider the freeing of the sigmoid a part of the operation. The sigmoid is often found adherent to the round ligament as far as the internal ring. Twice Young found it adherent to the bladder.

The uterus being held upward, the base of the left uterosacral ligament, or the one opposite the operator, is picked up with a long French clamp (Clamp 1) and a long catgut stitch is passed through it. It is then tied. This is repeated on the right ligament (Clamp 2). These stitches are then brought out over the edge of the wound and held by an assistant, Clamps 1 and 2 having been removed as each stitch was placed. These stitches serve two purposes; they hold the uterus out of the way, without injuring it, and bring the ligaments well into view. For demonstration purposes a towel may be used.

The left ligament, or the ligament opposite the operator, is now brought into view and the point of

shortening marked with a French clamp (Clamp 3). The other ligament is then exposed and a point on it opposite Clamp 3 is grasped with another French clamp (Clamp 4). The operator determines the point of shortening by traction on the ligaments, first, on one at a time, then on both together, being careful to allow ample rectal room and at the same time to replace the cervix in its normal position. This may be checked off by putting two fingers in the space between Clamps 3 and 4 and the anterior surface of the sacrum with the palmar surface of the fingers toward the uterus. In this way the operator may judge exactly the length of the proposed reconstructed sacral swing.

Two Allis clamps now grasp the ligament at its origin. The breadth of the jaw of the clamp is parallel with the ligament, one clamp above and the other below it, just at the site of the first catgut suture. Traction on these two clamps will draw the lower segment of the uterus into view and pull upon the base of the ligament. This will enable the operator to take the next step, which is to make the buttonhole. The buttonhole is made at the base of the ligament by means of a knife and extends along its median line. It should cut the catgut traction stitch. This incision should be 1 centimeter long and down to the uterine tissue. It is then extended to 1.5 centimeters along the ligament by placing a blunt pair of scissors in the cut and opening the blades.

A French clamp (Clamp 5) is then placed on the ligament midway between Clamp 3 and the Allis clamps, marking the reduplication point. Clamp 3 and the Allis clamps are now approximated to see if the sacral end of the reduplicated ligament will reach the buttonhole without strain.

A medium-sized Pagenstecher linen suture is now put in place in the ligament at the site of Clamp 3, which is then removed.

The needle is introduced into the buttonhole and made to penetrate the uterine tissue to a sufficient depth to give a firm hold, after which the suture is tied. During this procedure Clamp 5 is drawn upward and backward and slightly outward. This brings into view the three arms of the ligament, uterine, middle, and sacral. A second stitch is then placed through the lips of the buttonhole at right angles to the incision, and as it is introduced, first one, and then the other Allis clamp is removed. Before tying this second stitch, the first one is cut short. The second stitch closes the buttonhole, buries the first stitch, and completes the implantation of the sacral arm of the reduplicated ligament. This second stitch is left long for traction and marking purposes.

A third stitch is then placed through the three

layers or arms of the reduplicated ligament, midway in the folded-over area, or, if the reduplication is long enough to need it, two stitches may be used. Care must be taken to penetrate all three arms of the reduplication in each stitch to a sufficient depth to hold strongly. A stitch is then introduced at the site of Clamp 5 and carried through the sacral arm of the reduplicated ligament in such a manner that the joining will be smooth. All these stitches are left long and attached to clamps outside the abdomen for marking purposes. The procedure is then repeated on the opposite ligament.

By slight traction on these linen stitches the operator may judge of the completeness of his work and the length of the newly-made ligaments. As a further test, two fingers may be placed as at the time of placing Clamps 3 and 4.

The linen stitches are then cut short. The knots may be covered with a Lembert stitch involving only the peritoneum.

If in the opinion of the operator the fundus needs holding down and forward, the round ligaments are shortened, either by the Alexander operation or by a modification of the Gilliam operation which leaves no pockets in the peritoneum.

The author has performed 270 sacral suspensions of the uterus and 10 of the cervical stump after hysterectomy, a total of 280, with 2 deaths, one from acute nephritis, the other in a case in which excessive peritoneal trauma of a previous operation produced insurmountable complications.

When it is necessary to reconstruct extensive birth trauma, the operation should be done in two stages separated by one week or more.

The labors Young has attended after sacral suspension have been most satisfactory. The greatest number of labors in any one case has been four. This patient has since remained well without gynecological symptoms, the uterus is now in a normal position, and the adnexa are negative.

C. H. DAVIS.

Hernaman-Johnson, F.: X-Rays in the Treatment of Certain Forms of Dysmenorrhœa: A Plea for Their More Extensive Use. *Lancet*, 1919, cxcvii, 432.

The author advises more extensive use of the X-ray in cases of menstrual disturbance when medical methods, such as the use of drugs and hygiene, and minor surgical treatment, such as dilatation, have failed and there is no gross lesion or deformity.

Cases in which major surgery has been unsuccessful have also been helped by the X-ray. In other cases it is advisable to try X-ray treatment before doing a major operation as the method is without risk and does not interfere with a later operation.

Best success is obtained with the X-ray in the treatment of patients who are free from gross organic lesions but have excessive, prolonged, and frequent menstruation with the usual menstrual

pain, headaches, mental depression, and general debility due to excessive loss of blood. If pain is a more pronounced symptom than loss of blood, cure is less probable, but the treatment should be tried.

A wide cone of rays is used. The rays are filtered through 3 millimeter aluminum, the ovaries and the uterus being equally exposed and other parts of the body protected. Ordinarily 7 treatments are given during 5 intermenstrual intervals, 2 during each of the first intervals, the fourth interval being skipped, and a final treatment being given during the fifth interval.

At the time of the first period after the beginning of the treatments the symptoms are generally more severe, but at the second period are a little better. By the third period a distinct improvement is noted if the treatment is to succeed. In young persons small doses are given to restrain excessive ovarian function. The dose does not cause sterility nor burn the skin.

B. JAMESON.

Montgomery, E. E.: A Consideration of Uterine Myomata, with Some of the Complications Seen in Practice. *Am. J. Obst.*, 1919, lxxx, 256.

This study is based on the consideration of 251 consecutive cases subjected to operation, 102 to partial hysterectomy, 144 to complete hysterectomy, and the remaining 5 to removal of the myoma through the vagina.

Of the patients upon whom a partial hysterectomy was performed, 5 died, a mortality of 4.9 per cent, while of those subjected to complete hysterectomy, 8 died, a mortality of 5.5 per cent.

Due to the continued irritation or disturbance of the circulation, the presence of the fibroid increases the danger of complicating infections. Tubal collections are not infrequent, large hæmatomatous cysts of the ovary are also common, and in many cases extensive adhesions and inflammatory changes greatly complicate the operative procedure. In one case, where the small intestine with its mesentery was spread over a large fibroid, the author trimmed the growth out, leaving the coils of intestine adherent to its surface.

Often the appendix may become involved and therefore it should always be investigated. It was removed in 103 of the series of cases reported although this was not absolutely necessary in all. Not infrequently it will be found that it has undergone cystic change.

In numerous reports myoma is cited as a cause of carcinoma. In the cases reported, however, carcinoma was a complication in only 8. In 4 cases it involved the body of the uterus; in 3, the cervix; and in 1, the fallopian tube.

The author's data with reference to child-bearing are incomplete, and his records are confined to private cases. These show that 66 women had borne one or more children, 5 had been pregnant and had aborted, 22 were nulliparous, and 30 were unmarried.

EDWARD L. CORNELL.

Bailey, H.: Further Observations on the Radium Treatment of Uterine Cancer. *Am. J. Obst.*, 1919, lxxx, 300.

Three hundred and thirty-six cases are included in this report. Of this number there were 190 cases termed primary, that is, in which no operative procedure had been undertaken except perhaps in a few cases a mild cauterization or an operation of the Percy type. Eleven patients were treated as a prophylactic measure following a hysterectomy. Fourteen were treated for malignant disease of the vulva, vagina, or ovary. There were then 325 cases of carcinoma of the uterus with evident malignant growth at the time treatment was begun. All of the cases were followed both by letter and by actual examination at a return clinic held once a week at the hospital.

Since 1916 the most advanced cases have been rejected in all but a few instances. Cases in which there is ulceration receive much more palliation from the zinc chloride or the acetone treatment. Advanced cases in which the parametrium is deeply involved on one or both sides, providing they are primary so that the cervix offers a location for the radium approximately in the middle of the tumor, are frequently greatly benefited, even to the extent that, as occurred in two instances, they are freed from signs of the disease for considerable periods. These cases probably do better with preliminary cauterization.

The results have been disappointing. Further development of tumor tissue in the parametrium has occurred early in every case. In the borderline cases the most amazing results were obtained with radium which rendered most of them operable and in nearly all caused the disappearance of cancer cells in the local lesion. In the author's series the latter statement was upheld by the pathologic picture in 7 uteri removed following radiation. In none was there found any cancer of the cervix. Of 17 patients who belonged to this class in 1918 and were treated with radium alone, 5 died of cancer and 8 are in poor condition. Four in this group are in good condition and may have some prospect although to date they cannot be said to be free from all clinical evidence of the trouble.

Through a period of four years 21 operable cases were treated; 2 in 1915, 4 in 1916, 3 in 1917, 11 in 1918, and 1 in 1919. Five of these were operated upon after the treatment. Five cannot be included in this consideration.

Of the 16 patients remaining one patient with cancer of the cervix died and one with cancer of the fundus died after the operative removal of the uterus. Fourteen patients are still alive. Of these, 7 had cancer of the body of the uterus, and 7, cancer of the uterine cervix. Four of the former and 3 of the latter are in good condition. Of the remainder, 4 are in poor shape and the remaining 3 in a hopeless condition. One patient with cancer of the uterus and one with cancer of the cervix have been well for over four years, one with cancer of the cervix has

been well for two years, and 9 have lived more than one year since the treatment.

The prophylactic treatment following the removal of the tumor offers a field in which a great deal may be accomplished, provided the operator does not remove most of the vagina as this cavity gives the only practical entrance for radium applicators. There were 11 such cases, with one death, and 2 in which there was a general fibrosis of the pelvis with return of the tumor. In 8 cases there is no clinical evidence of the disease, and in 7 of these, this condition had continued for periods longer than one year.

In a number of cases of early recurrent cancer following hysterectomy, treatment with massive doses and by cross-fire has resulted in complete retrogression, and in numerous cases, in a prolongation of life. In 27 of such cases in 1918 there were only 8 deaths. The rest of the patients were discharged from the records by May 1, 1919.

The technique followed by the author is given in detail and 8 case reports are appended. The conclusions drawn are as follows:

Practically all of the patients treated by complete radiation of the local lesion and the lymphatic and other involved tissue in the parametrium pass through a period of improvement. In all but the more advanced conditions this improvement consists of a disappearance of the ulceration, a lessening or entire disappearance of the discharge, a gain in weight, and a general improvement in health. Undoubtedly life is prolonged. In a number of cases there is some slight degree of rectal irritation, beginning a week or ten days after treatment and lasting two or three weeks. In a few instances there is a fibrosis of the pelvic connective tissue, especially at the base of the broad and uterosacral ligaments. When this bridge of tissue constricts the rectum to any marked degree a fistula communicating with the vault of the vagina forms above it. When this occurs all pain is relieved and the patient gains at once and is not nearly as miserable as might be expected.

After a longer or shorter time of well-being following the treatment many patients have further development of cancerous tissue behind the vault of the vagina. In the effort to save those that have a retrogression after six or eight months, the author has pushed the radium treatment of the parametrium, both by vaginal and by surface radiation, to the highest limits of safety and has thereby caused in many who now appear to be free from cancer various types of pelvic sclerosis, both mild and severe.

The method in use makes it possible to give the entire treatment in a forty-eight hour period and with only moderate discomfort to the patient. In most instances the local slough and signs of irritation in the vault of the vagina, seen so frequently following the use of the older method, are now absent.

The most spectacular results in the entire series were those of the 4 Wertheim operations which followed a month after the radiation. In 3 of these

no cancer cells were found in the uteri or the parametrial tissue that was removed, while in the fourth case only a few markedly hydropic and degenerated cancer cells were present in the parametrium.

From the results in cases of cancer of the uterine body it would appear to be necessary to remove the uterus after a preliminary radiation or, when this is inadvisable, to radiate the entire pelvis as completely as is done in cases of cervical tumor.

The results in cases of recurrent cancer following a hysterectomy are very promising. It should be understood that it is as important to radiate these patients immediately after operation as it is to operate early in the course of the disease.

So great has been the palliation from the radium that it may be said that no uterine cancer case receives proper treatment without thorough radiation of the tissues of the pelvis. EDWARD L. CORNELL.

Janeway, H. H.: The Treatment of Uterine Cancer by Radium. *Surg., Gynec. & Obst.*, 1919, xxix, 242.

The writer briefly reviews the published statistics regarding the radical removal of the uterus in cases of cancer. For convenience, these statistics are arranged in three tables showing the number of cases, the percentage operability, the operations, the mortality, the number of traced cases from three to five years after operation, the cures, the name of the surgeon, and the type of operation. From this study the author concludes that the radical operative treatment of cancer has not proved satisfactory in that such a comparatively small percentage of cases are operable and the immediate mortality is high.

Also reviewed are the published reports on the treatment of uterine cancer with radium. Janeway agrees with other writers in regard to the importance of radium as a therapeutic agent in this condition. He reports 17 cases of carcinoma of the cervix, 12 clinically cured to date, from three and one-third years to six months after treatment. In 4 cases of recurrent carcinoma of the cervix, 2 of the patients were clinically cured sixteen and twenty-five months after treatment, respectively, and 1 was improved. Of 4 cases of carcinoma of the fundus, 2 were clinically cured fourteen and twenty-one months after operation, respectively. In 5 cases of carcinoma of the external genitals, 3 patients have been clinically cured to date, twenty-one and sixteen months after treatment was begun, 1 is improved, and 1 unimproved.

The article gives a brief résumé of the dosage, the hours of exposure, and the method of applying the radium as reported by different writers. In his own work Janeway has used single applications of radium, dividing it into three or six capsules which are applied at different points to insure cross-fire radiation.

The methods of application employed are described as follows:

"For cancer of both the fundus and the cervix we advise the use of three of these tubes containing 150

milligrams of radium and inserted in the uterocervical canal, arranged end-to-end in a long rubber tube. For cancer of the cervix three additional tubes are placed against the cervical ulcer. The tubes placed against the cervical ulcer should be distributed evenly over its surface and the best method of retaining them in such a position is by embedding them within a mold of the cervical ulcer and vagina made of dental modeling compound. This compound is the preparation which dentists use for obtaining impressions of the teeth. Placed in hot water, it becomes soft like putty, and in this condition may be inserted into the vagina. Left there, it cools to the body temperature at which it becomes hard enough to retain its shape. It forms, therefore, a perfect mold of the interior of the vagina and may be easily removed and re-inserted, and when re-inserted it always finds the same position in the vagina. Upon this mold is an impression of the cervical ulcer. The three radium tubes may be embedded at equal distances from each other within the area of the mold which shows the impression made by the cervical ulceration. When the mold then is re-inserted into the vagina, these tubes come into accurate apposition and are evenly distributed over the ulcer. This mold serves an additional function in holding the vaginal walls, and with them the bladder and rectum, away from the cervix and the radium lying against it, and thus protects these organs from burning. If the radium is so placed that it comes into dangerous proximity to the bladder and rectum, a piece of lead may be embedded behind it, in the opposite surface of the mold, thus still more completely insuring the protection of the bladder and rectum. An absolute protection of the bladder and rectum and overhanging vaginal walls is not desirable. Schottlaender and Kermauner have shown that in a definite percentage of cases of cancer of the cervix, metastatic extensions are already present in the vaginal walls, at some distance from the cervix. It is, therefore, not desirable to protect the vagina too strongly when applying radium to the cervix.

"Some protection is advantageous because in its absence disagreeable bladder and rectal tenesmus and discomfort from burning in the vagina can follow strong applications to the cervix. The cervix itself is practically insensitive to strong treatment. I have found that the separation of the vaginal walls by the dental molds is sufficient and yet allows a desirable amount of radiation of the vagina.

"Special provision for directing strong radiations against the broad ligaments with a comparative neglect of the anterior and posterior parametrium is probably unsafe as compared with a uniform radiation of all the parametrial tissue.

"The distribution of the radiations should, therefore, be made as diffuse as possible around the cervical ulcer as a center.

"Attempts to supplement the internal treatment of uterine cancer for the purpose of more effectively reaching extensions into the uterus, broad ligaments,

and lymph nodes by the application of heavily filtered radium over the abdomen are of undetermined value."

C. H. DAVIS.

Vital Aza: The Treatment of Uterine Cancer with Radio-Active Substances (Tratamiento del cáncer uterino mediante el empleo de las sustancias radio-activas). *Med. Ibera*, 1919, Número extraordinario, 1 Cong. nac. de med. y ciruj., 62.

Radio-active substances cause atrophy and death of neoplastic epithelial cells by diminishing and suspending mitosis. This destruction is followed by very active proliferation of the connective tissue leading to cicatrization by which the loss in the tissues is made up. Clinically the author has observed cures of epithelial neoplasms by the use of radium and mesothorium.

In gynecology limited or operable cancers of the uterine cervix are influenced favorably by radium treatment, the figures being clinical cures in 80 per cent of the cases and cures continuing for more than three years in 50 per cent. Inoperable cancers of the cervix are clinically cured in 58 per cent of the cases and in 38 per cent appear to remain cured after a period of three years.

Cancers of the body of the uterus should still be treated chiefly by the surgeon when there are no conditions of a general nature to prevent it.

Roentgen-ray treatment may be combined with radium treatment. Chemotherapy is also an efficacious adjunct to radium treatment as it sensitizes the epithelial cells.

Postoperative recurrences should be treated with radium, mesothorium, or roentgen rays but the chance of cure is small.

When there is co-existence of uterine cancer and pregnancy radium therapy may be tried with success.

In summarizing, the author states that he is far from considering that the problem of uterine cancer is cleared up by radium therapy since as yet the mortality is very high. However, as the death rate in cases treated by operation is equally high, radium treatment is justified not so much by its paltry successes as by the failures of surgery.

M. M. MATTHIES.

EXTERNAL GENITALIA

Legueu, F.: The Transperitoneovesical Route in the Treatment of Certain Vesicovaginal Fistulæ (De la voie transpéritonéovésicale pour la cure de certaines fistules vésico-vaginales). *Ann. de gynéc. et d'obst.*, 1919, xliii, 414.

Legueu refers especially to operative vesicovaginal fistulæ following total hysterectomy. His operative technique is divided into five stages. The first stage consists in splitting the posterior bladder wall by a median incision carried to the mucosa and as far as the vagina. The vagina is opened and the fistula laid bare from the bladder to the vaginal orifice. In the second stage the bladder orifice is separated from the vaginal orifice. In the third

stage the upper extremity of the vagina is sutured with silk. In the fourth stage the bladder is sutured in several planes, i.e., a catgut suture which includes the mucosa and part of the muscular layer, a silk suture of the muscle and serosa, and a third row of peritonization sutures. The last stage is the peritonization of the bleeding surfaces. If possible, the upper vaginal stump is peritonized under the peritoneum of the broad ligament.

Legueu has operated upon 12 cases in this way, 11 of which were operative fistulæ following abdominal hysterectomy and 1 an obstetrical fistula. There was one death. The patient who died had a bladder perforation the size of a 5-franc piece following a hysterectomy. Death was due to anuria and uræmia, but the ureters were not involved by the ligatures and the bladder was not cut. The result would have been the same if any other method had been followed. The other 11 patients recovered without incident, recovery being immediate and complete.

The method described is rarely indicated in cases of obstetrical fistulæ as generally they are situated too low. It is of greatest value for fistulæ situated high, especially those following total abdominal hysterectomy.

W. A. BRENNAN.

Koster, H.: An Operation for the Restoration of the Rectovaginal Septum. *Am. J. Obst.*, 1919, lxxx, 173.

The operation described was devised by Weisbrod of Brooklyn fifteen years ago. The various steps are illustrated. It has been used in the treatment of more than 2,000 patients, a considerable percentage of whom were subsequently followed through labors in the obstetrical service at the same institution. The results as regards elasticity of the repaired parts were most gratifying. Excluding the customary breakdowns incident to infection in the usual small percentage of cases, the operation has not failed to accomplish the desired result, namely, reconstruction of the rectovaginal septum with permanent obliteration of the rectocele.

E. L. CORNELL.

MISCELLANEOUS

Dalché, P.: The Pituitary Gland in Gynecology (L'hypophyse dans le traitement des maladies des femmes). *Rev. mens. de gynéc. et d'obst.*, 1919, xiv, 165.

Dalché reviews the physiological action of pituitary extracts, i.e., their vasoconstrictive and coagulating power and slight tendency to increase the blood pressure.

In clinical therapeutics the genital condition which most frequently indicates treatment with pituitary extract is metrorrhagia. It should be remembered that the action of the pituitary gland is especially marked during menstruation. The hyperovaria of puberty which is manifested by metrorrhagia is therefore one of the first indications for the use of pituitary extract.

Utero-ovarian hyperæmia in the young is another indication, as well as certain cases of congestive dysmenorrhœa and menstrual ovaritis.

At the time of the menopause pituitary extracts are of value in the treatment of uterine sclerosis. While this condition is observed at every age, it is more frequent in the old.

During the period of genital life from puberty to the menopause, the most important indication is the hæmorrhage due to fibroids. In bleeding fibroids pituitary extracts are a most useful medicament. Also in intermenstrual dysmenorrhœa, as well as certain general disturbances of genital origin (tachycardia, obesity) the extracts will be found of value.

Dalché does not use injectable extracts. He prefers powders to be taken by mouth. The dosage recommended is from 20 to 40 centigrams per day. He often combines the pituitary extract with other glandular extracts, i.e., those of the ovary, thyroid, etc., according to the indications.

W. A. BRENNAN.

Recaséns, S.: Menstrual Psychoses (Psicosis menstruales). *Med. Ibero*, 1919, Número extraordinario, 1 Cong. nac. de med. y cirug., 67.

Menstruation frequently produces psychic disturbances which range from melancholic depression to acute mania.

The pathogenesis of such psychic changes of menstrual origin is rooted, probably, in a derangement of the equilibrium of the hormones due to endocrine insufficiency and especially an insufficiency in the secretion of the ovary.

The manifestations of psychic disturbance occur in oligomenorrhœa or complete amenorrhœa; ovarian hyperfunction does not produce them.

The acute mania of menstrual origin appears on the days preceding the menses and diminishes or disappears slowly some days after the termination of the period.

Menstrual psychic disturbances very frequently accompany sclerocystic ovaritis and genital hypoplasia.

The psychic states which appear to be related to the menstrual function may be prevented or corrected by opotherapy, especially homologous or homorganotherapy.

The use of grafts of human ovaries is an efficacious method of curing this type of nervous condition.

Arsonvalization and, in general, the use of high

frequency currents in conjunction with opotherapy are curative means giving excellent results in acute and intermittent cases.

Extirpation of the nymphæ and clitoridectomy are of no value whatever. M. M. MATTHIES.

Neel, J. C.: The Etiology and Treatment of Cystocele. *Surg., Gynec. & Obst.*, 1919, xxix, 320.

The author gives a brief statement regarding the cause of cystocele and advocates a lapping-over of vesicovaginal fascia according to the general scheme of repairing herniæ in other portions of the body. He describes the technique of his operation as follows:

The cervix is drawn down and a deep transverse incision is made just below the bladder wall, through the vaginal mucosa and the underlying fascia. The proximal flap is caught with forceps, care being taken to include the fascia. With a pair of blunt scissors, preferably the Mayo type, the dissection is carried between the muscle wall of the bladder and the fascia to the urethra. A median incision is then made and the bladder is dissected free from the cervix and fascia and displaced upward to its normal position. This section is carried out by a small piece of gauze over the finger, the pressure being applied chiefly over the fascia and the edge of the bladder. The fascial and mucosal edges are then caught separately with clamps and the separation is begun by sharp dissection, care being taken to locate the proper layer in order to preserve the entire fascia. By blunt dissection the separation is carried well up to the pubic bones on either side. The remaining steps of the operation are identical with those employed in the treatment of hernia. The two flaps of fascia are overlapped by mattress sutures of No. 2 chromic catgut which are placed as close as possible to the pubic bones. The excess mucosa is then excised and the cut edges are approximated with a running suture of catgut.

The author states that this operation was first performed by him in July, 1916. Since that time he has employed it in all cases of cystocele and in none has there been even the slightest tendency toward a recurrence. Recently he saw a delivery at term of a patient upon whom he had performed this operation one and one-half years previously. The labor was not delayed, the bladder did not appear in sight during the entire delivery, and there was no tearing of the anterior vaginal wall.

C. H. DAVIS.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Emge, L. A.: Pregnancy after Uterine Suspension.
California State J. M., 1919, xvii, 320.

The author reports a series of cases following ventral suspension which were observed in the Stanford Woman's Clinic. All types of suspension operations are represented in the series, including the Webster, Gilliam, Kelly-Neel, Coffey, and ventral, and 17 cases in which the type was unknown. A total of 35 cases are tabulated. Twenty of the women were delivered normally and thirteen (37½ per cent) had dystocia which in 7 cases (20 per cent) necessitated operative deliveries. Of the operative cases 4 were high forceps cases, while in 2 a version was done and in 1 a cesarean section. None of the patients experienced undue difficulty during pregnancy.

The writer believes that experience has shown that much obstetrical pathology, such as spontaneous abortion, placenta prævia, atypical presentation due to distortion of the uterus, difficult labor requiring operative interference, inability of the cervix to dilate on account of faulty anatomical position, the early formation of Bandl's ring, and the dangerous thinning out and sacculation of the posterior wall of the fundus, are attributable to ventral suspension and the commonly associated fixation.

Treatment varies from simple corrective measures to difficult operative interference. If the distortion of the uterus is such that delivery is doubtful, classical cesarean section will always be the most hopeful procedure.

In closing, the writer emphasizes his belief that the child-bearing age and suspensions which may fix the uterus to the anterior abdominal wall are incompatible.

H. K. GIBSON.

Beck, A. C.: The Treatment of Extra-Uterine Pregnancy after the Fifth Month. *J. Am. M. Ass.*, 1919, lxxiii, 962.

From a study of 262 cases of extra-uterine pregnancy operated upon after the fifth month, the author comes to the following conclusions:

There is very little added risk in delaying the operation until the thirty-eighth week if the patient is kept under observation.

Interference at the thirty-eighth week offers the best opportunity for the survival of the child.

Preliminary preparation for the treatment of hemorrhage should precede operation.

Before attacking the placenta a careful exploration should be made.

Removal of the placenta gives the best results.

The conditions which favor removal of the placenta are: (1) its attachment by a pedicle which can be ligated; (2) easy exposure of the ovarian and uterine extremities of its blood supply; and (3) easy exposure of the ovarian extremity of its blood supply on the side involved and sufficient accessibility of the uterus to permit a hysterectomy from the opposite side and ligation of the uterine end of the placental supply.

Preliminary ligation of the vessels supplying the placental site should precede all attempts at removal. When preliminary control of these vessels is impossible, the placenta should be left in the abdomen.

Closure of the abdomen without drainage is indicated when hemorrhage and infection are absent, even though the placenta is not removed. The retained placenta will ultimately be absorbed.

There is a slight danger of secondary hemorrhage, and occasionally there may be infection from the adjacent intestines before absorption is complete.

These complications will necessitate a second operation. If suppuration takes place, drainage may be obtained through the vagina.

Marsupialization should be limited to cases in which the removal of the placenta is contra-indicated and the presence of infection requires drainage, or in which hemorrhage necessitates the use of a tampon.

Continuous drainage invites infection in these cases, as is shown by the results obtained when this was a procedure of choice. EDWARD L. CORNELL.

Williams, J. W.: An Early Ovum in Situ in the Act of Aborting. *Am. J. Obst.*, 1919, lxxx, 269.

The specimen described was contained in a uterus removed by supravaginal amputation. It was of interest because it represented an early human ovum removed thirty-eight days after the cessation of the last period; because it was already hopelessly abnormal and represented the youngest stage of hydatidiform mole with which the author was familiar; and because it was in the act of aborting and gave important information concerning the mechanism of abortion.

In the first 180 of the 900 serial sections it was found that the egg lay free in the uterine cavity and consisted merely of a chorionic membrane devoid of villi which enclosed a relatively large cœlomic cavity. The former was separated from the surface of the decidua vera by coagulated blood. In the next 120 sections the ovum was found to be enclosed between a quite thin decidua capsularis on one side and a thin layer of compact decidua on the other, which latter was separated from the main compact layer by a narrow slit covered on either surface by cuboidal epithelium. In this area a few villi pro-

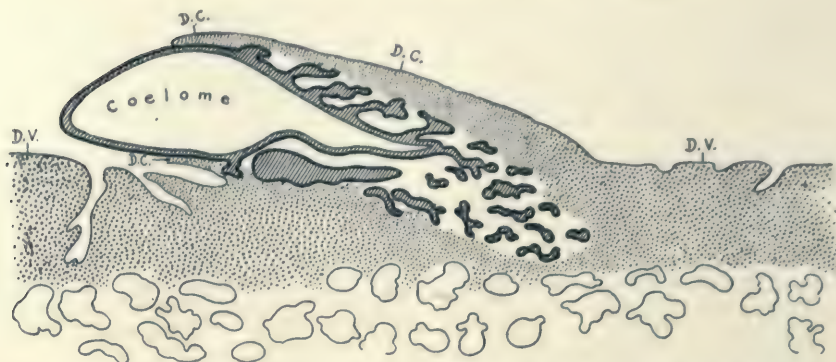


Diagram constructed at right angles to the plane of the serial sections showing the ovum partly free in the uterine cavity and partly embedded in the compact layer of the decidua. D. C.: Decidua capsularis. D. V.: Decidua vera.

jected from the periphery of the chorionic membrane.

In the next 300 to 350 sections, the decidua capsularis was thicker and the lower surface of the egg directly in contact with the compact layer of the decidua basalis which became thinner so that eventually the glands of the spongy layer of the decidua became visible. At the same time the chorionic villi became more abundant and more complicated in structure, while the coelomic cavity became smaller and smaller and eventually was reduced to a small slit. Following this, the remaining sections showed that all that was left of the egg was deeply embedded chorionic villi and in the section following even these had disappeared. In this portion of the specimen the decidua capsularis was relatively thick, while the opposite surface of the egg was in contact with the spongy portion of the decidua basalis.

The author attempted to reconstruct these conditions in the accompanying diagram which represents roughly the relative participation of the several portions of the egg. In studying this diagram it should be borne in mind that the sections were cut at right angles to the plane represented. It clearly shows that the proximal pole of the ovum lay free in the uterine cavity, while its other four-fifths were enclosed within the compact layer of the decidua and came nearer the spongy layer as the distal pole was approached.

This was a very early abortion in progress. One pole of the decidua capsularis had ruptured and the corresponding pole of the ovum was being extruded through the defect while the opposite pole still retained its organic connection with the adjacent decidua.

EDWARD L. CORNELL.

Morse, A.: Experimental Reproduction of Premature Separation of the Placenta. *Am. J. Obst.*, 1919, lxxx, 283.

The intramuscular lesions of the uterus in premature separation of the placenta are not provoked by an acute distention of the uterine cavity. They

depend upon obstruction of the uterine circulation. When such an obstruction is produced artificially in rabbits by ligating the veins of one horn of the bicornate uterus, the lesions resulting are identical with those in women with premature separation of the placenta. Similar lesions are observed also following simple rotation of the uterus.

The primary lesion in placental separation is an engorgement of the decidual sinuses and a hæmorrhagic extravasation into the decidua. The intramuscular hæmorrhages occur as a secondary lesion when the circulatory disturbance is excessive. Probably the excessive mobility of the uterus predisposes to a similar, though spontaneous, acute constriction of the veins of the broad ligament in women advanced in pregnancy. The albuminuria which sometimes accompanies placental separation is probably secondary to the disturbance in the uterine circulation and not an indication of a primary nephritic toxæmia. EDWARD L. CORNELL.

Pellissier, P.: The Epidemic of Influenza, 1918-1919, in the Tarnier Clinic (L'épidémie de grippe, 1918-1919 à la clinic Tarnier). *Arch. mens. d'ost. et de gynec.*, 1919, viii, 28.

In the Tarnier obstetrical clinique at Paris during 1918-1919, 75 cases of influenza were observed in the course of pregnancy or labor.

In these cases the form of the epidemic was almost exclusively pulmonary. Of the 75 women, 16 died, a mortality of 22 per cent.

Labor occurring in the course of influenza, and particularly at its beginning, aggravated the disease. The aggravation consisted in an increase of the pulmonary and cardiac disturbances as well as in the phenomena of intoxication of the organism.

Genital infection did not appear to be more frequent among patients with influenza.

The lacteal secretion was not interfered with by the disease.

Hæmorrhages were not particularly frequent before or after labor.

Neither the progress of the labor nor the delivery was modified in influenza patients. Except when the condition of asphyxia of the mother indicated that efforts at expulsion should be avoided, there was no more than the usual intervention.

Abortion occurred in 20 per cent of the cases and premature delivery in 77 per cent.

Of 27 infants born prematurely from the seventh month there were 11 still-births or deaths immediately after birth (52 per cent). Five of 20 infants born at term were dead (25 per cent). Two, which were born alive, became diseased and recovered (10 per cent). Among 5 infants from 1 month to 6 months of age there were 3 deaths (40 per cent). One of the 2 remaining infants was attacked by the disease but recovered.

The facts suggest to the author that when influenza shows its maximum intensity in a woman gravid less than six months, it causes her death before the expulsion of the foetus. In severe cases it often kills the foetus.

When the pregnancy is advanced from seven to eight and one-half months the very severe forms of influenza cause the death of the foetus first and then of the mother before premature delivery is produced. Premature delivery is most frequent at this period of the pregnancy. It is not accompanied by any obstetrical complications, but the condition of the mother is aggravated.

W. A. BRENNAN.

Anderodias, J.: Influenza of Pulmonary Type and Pregnancy (Grippe à forme pulmonaire et grossesse). *Rev. mens. de gynéc., d'obst. et de pédiat.*, 1919, xiv, 201.

The recent epidemic of influenza has again demonstrated the gravity of this disease when it attacks the pregnant woman. The author gives short histories of 20 cases observed between August, 1918 and March, 1919. The prognosis was more unfavorable than in previous epidemics of this nature, the mortality being 34 per cent. This figure is supported by the replies to inquiries made of other obstetricians.

The 20 cases reported were cases of influenza with pulmonary complications and in all the period of pregnancy was at or beyond the fourth month. The predominating form of pulmonary complication was either a uni- or a bilateral pneumonia. Of 8 patients with double bronchopneumonia, 5 died; of 13 with unilateral bronchopneumonia, 4 died; of 3 with pulmonary congestion, 1 died. There were no deaths in 5 cases of simple bronchial influenza.

Of 11 of these women who either aborted or had a premature delivery, 6 died and there was no abatement of the symptoms in any case after the expulsion of the foetus. The latter rather aggravated the condition. In 6 cases in which the disease caused the death of the foetus in the uterus, 5 of the women died.

The effects of influenza epidemics generally on the development of pregnancy is a matter concern-

ing which opinions are much divided. The effect of any particular epidemic as regards the termination of pregnancy is a function of the severity of the infection and of the complications arising from it.

Several of the women in the author's 20 cases were near term at the time of the influenzal attack. Of 8 women less than seven months pregnant, 3 aborted; of 16 pregnant longer than seven months, 7 were delivered prematurely.

With regard to the question as to why influenza so often interrupts pregnancy, the author is inclined to believe that the answer must be sought in the toxins formed by the infecting bacteria which act on the nerve centers and the uterine muscle fibers. The intoxication alone is sufficient to cause the death of the foetus within the uterus.

In the 20 cases 3 of the women did not come to labor during the disease period but went to term and were delivered of healthy infants. In the other 26, 16 infants survived. In 9 cases the foetus died in the uterus or the mother died undelivered. One infant which was born prematurely died after fifteen days. The proportion of the infants saved, i.e., 61 per cent, is sufficiently high to show that the bacterial toxin is not always fatal to them even in very severe infections. In 3 cases in which the mothers died from the attack the infants lived.

The treatment employed has been venesection subcutaneous or intravenous injections of electrargol, fixation abscesses, and camphorated oil in large doses. Induced labor is not recommended.

W. A. BRENNAN.

Delle Chiaie, S.: Sterilization of the Woman in Caesarean Section (Sulla sterilizzazione della donna nel parto cesareo). *Riforma med.*, 1919, xxxv, 355.

Della Chiaie is not a partisan of the systematic sterilization of a woman destined to repeated caesarean sections. There should be other factors beside the patient's wishes and the possibility of danger (which latter he believes is exaggerated) to justify such a procedure. In 15 cases of repeated caesarean operation he has sterilized the patient in only 5 instances. He finds most methods of sterilization faulty. In his most recent operation he uses a method of his own which, beside being very simple to execute, is more trustworthy as to its efficiency and has the advantage that it does not alter the topographical relations between the uterus and the adnexa. This technique is as follows:

1. The tube is detached from the corresponding uterine horn by two incisions, one anterior and the other posterior, made as if a small wedge of muscular tissue were to be removed.

2. At about a centimeter in front of the tubal angle a buttonhole is opened in the uterine wall with care to avoid injuring the round ligament and penetrating into the cavity of the organ.

3. The extremity of the tube detached from its normal insertion is grafted into the new trajectory by fixing it with two or three silk sutures.

4. The same manœuvre is done on the opposite side.

This short operation resembles the salpingo-utero-anastomosis as practised by Walkins from which it differs only in that the author resects the tube.

In the two cases in which the operation has been done it has prevented pregnancy for three years and two years respectively.

W. A. BRENNAN.

LABOR AND ITS COMPLICATIONS

Jegge, E.: *The Complications Arising from Obstetrical Examinations and the Value of External Manipulation* (Das Risiko der inneren geburtshilfflichen Untersuchung und ihr Ersatz durch äussere Verfahren). *Cor.-Bl. f. Schweiz. Aerzte*, 1919, xlix, 1033.

The morbidity rate of the puerperium still varies from 5 to 20 per cent despite the very great precautions for asepsis taken during recent decades. Jegge believes that this is due principally to the spontaneous infection of the patient herself as it is impossible to render the vagina absolutely aseptic, especially in multiparæ. Since the introduction of rubber gloves the morbidity has decreased only by from 1 to 2.5 per cent.

In the year 1917, in the Frauenspital, Basel, 500 parturients were examined internally with every precaution and their condition compared with that of 500 others not so examined from 1914 to 1917. These included only cases of spontaneous delivery. The tabulated results given by Jegge show that the morbidity was considerably higher in the women who were subjected to internal examination than in those not examined in this way, being 8.5 per cent in the former and only 5.2 per cent in the latter.

These findings have led to the discontinuance of such internal examinations.

By methods described by Jegge the desired obstetrical information is obtained in 95 per cent of the cases without a vaginal examination. The degree of dilatation of the os may be ascertained almost as well per rectum as by way of the vagina. While the rectal route does not give information as to the external os, this can be found by palpating the contraction ring, the ridge where the thick non-elastic body of the uterus joins the cervix. The latter is an elastic tube which, as it stretches, pushes the circular contraction ridge or band before it. The palpating finger can follow this band and its height is an index of the increasing diameter of the os. Jegge's experience with this method of palpation has demonstrated that it is instructive and reliable in 91 per cent of cases. It failed absolutely in only 4 per cent.

The author insists that by using the various external methods of examination the internal examinations through the vagina may be entirely avoided in almost every case. The internal examination should be resorted to only when indications call for rapid and special methods of delivery or when the findings by external manœuvres are too vague to

give the necessary information. Generally obstetricians fail to recognize the risks they run by resorting to internal examinations, especially in cases in which pelvic anomaly or placenta prævia may render a cesarean operation necessary.

W. A. BRENNAN.

Wilhelm, F. E.: *The Hour-Glass Uterus*. *J. Missouri M. Ass.*, 1919, xvi, 295.

Wilhelm reports six cases of hour-glass uterus and states that this condition should be suspected in obstetrical cases when, though the passage and passenger are normal, the child does not descend. In five of the author's series of cases manual dilatation of Bandl's ring which was about the neck and version under deep ether anæsthesia were followed by extraction. All of the infants were born dead. In the sixth case, dilatation was easier and forceps were applied. In this instance the child was alive.

Hour-glass contraction of the uterus may occur: (1) in front of the entire foetus; (2) about some part of the foetus; (3) following delivery of the foetus and ahead of the placenta; and (4) following one twin and ahead of the second child. The author's conclusions are:

1. Foetal mortality in cases of hour-glass uterus is high.
2. Hour-glass uterus is most apt to occur in primiparæ.
3. Little danger to the mother results from manual dilatation and delivery.
4. The best results are obtained when the diagnosis is made early.
5. Cæsarean section is the method of choice when the ring is ahead of the entire foetus.
6. The contraction ring occurs most often in prolonged labors with malposition of the foetus, though the ring may be the cause rather than the effect.

W. F. HEWITT.

PUERPERIUM AND ITS COMPLICATIONS

Copeland, G. G.: *The Treatment of Puerperal Septicæmia. A Special Consideration of Intravenous Sterilization with Chlorazene and Eusol*. *Canadian Med. Quart.*, 1919, ii, 407.

More than 8,000 women die every year in North America from puerperal sepsis and the writer believes that 95 per cent of the appalling mortality and morbidity is preventable by a minimum of interference and a flawless technique in the treatment of obstetrical cases.

In 75 per cent of cases a vaginal examination during labor is not necessary as the presentation, the descent of the presenting part, the dilatation, softness, and thickness of the cervix, and the state of the membranes may be ascertained by combined abdominal and rectal examination. The vulva should be shaved and an abundance of soap and water and an efficient antiseptic solution should be

used, care being taken that no contaminated fluid enters the vagina. Other treatment should consist in general measures, rest in bed, sunlight, fresh air, easily digested food, plenty of water, large doses of quinine (later iron), and if the stomach will tolerate it, a fresh yeast cake. If the stomach is upset, glucose may be given by rectal drip, interstitially, or intravenously.

The writer knows of no better method of bracing a starving and toxic heart than the use of 200 grams of glucose in 1,000 cubic centimeters of saline solution sterilized by boiling and given interstitially. Elimination by the kidneys, bowels, and skin should be stimulated but the patient must not be exhausted by excessive purgation. Special toxins and bacteria may be eliminated from the genital tract by posture. The uterus should not be entered except for the treatment of hæmorrhage. Retained membranes and bits of placenta will drain out with the lochia. If in cases of blood-stream infection it is certain that a considerable piece of placenta is retained and conditions are favorable for its removal, it might be advisable to clear it out with the gloved finger covered with sterile gauze and employ continuous irrigation with Carrel-Dakin solution in the manner described by Sherman. In the absence of blood-stream infection one should hesitate before entering the uterus as this procedure might convert a local infection into a general infection. It is almost impossible to touch the interior of the uterus without dislodging infected thrombi into the blood stream and breaking down the wall of leucocytes. Chloroform should not be used as an anæsthetic as it destroys the white blood cells.

If septic foci develop, as in pelvic cellulitis, they should be dealt with by recognized surgical methods at the opportune time. If a definite diagnosis can be made and conditions and experience warrant it, the ligation and removal of thrombosed and infected veins may be productive of much good but is a risky procedure unless the surgeon is skilled and familiar with this special region.

When the specific organism has been demonstrated in the blood stream by smear or culture or when the clinical course indicates its probable existence, a stock antitoxic serum may be of great value if given early and in large doses. However, the author believes that this is of greater value when the bacterial toxins are being absorbed rather than when the organisms themselves are being thrown into the blood stream. When the temperature is rapidly falling the serum should be withheld for a time at least as bad results have been reported following its administration under such conditions.

The author has been unable to obtain consistently good results with colloids of gold and silver given intravenously. On the basis of his own experience and that of many others, he believes that we have now powerful therapeutic agents in certain chlorine compounds. The intravenous injection of chlorazene (chloramine-T), eusol, and certain arsenic preparations such as salvarsan, galyol,

arsphenamine, diarsenol, etc., has proved beyond a doubt that they are powerfully germicidal. The author's results with chlorazene, and to a very limited extent with galyol, have been strikingly good. To his knowledge no bad effects have been noted following the administration of chlorazene, although he has heard of one death following the intravenous injection of undiluted eusol. This cannot be said of salvarsan and its allied products. Carrel-Dakin solution when given intravenously has caused hæmolysis.

The author reports one case in his series in which a rigor and a temperature of 103 degrees Fahrenheit on the second day postpartum were followed on the third day by a temperature of 105 degrees. The blood culture was teeming with virulent streptococci. After an intravenous injection of chlorazene, there was another rigor, the temperature rose to 106 degrees, and the woman appeared to be in extremis, but on the following day the temperature fell to 97 degrees and further blood cultures proved negative.

The article is summarized as follows: In the majority of cases the uterus should be left alone. Glucose in saline solution given intravenously or interstitially is an excellent food and stimulant for a toxic and starved heart. The intravenous injection under strict asepsis of 13.8 grains of chlorazene dissolved in 100 cubic centimeters of cold sterile water diluted with physiological saline solution to 400 cubic centimeters and brought to blood heat seems to kill the streptococcus and several other organisms in the blood-stream infection and also to destroy the toxins. This will constitute a cure if reinfection does not occur. If necessary, it may be repeated in four or five days. The dose mentioned is a maximum dose; smaller doses have also been effective. Eusol may be given intravenously diluted four times with sterile saline solution. Death follows the administration of undiluted eusol.

The author reports twelve cases in which there were two deaths, one due to streptococcal bacteræmia and the other to infection by a Gram-positive diplobacillus which was not affected by the chlorazene.

H. K. GIBSON.

MISCELLANEOUS

Denis, W., and Talbot, F. B.: A Study of the Lactose, Fat, and Protein Content of Women's Milk. *Am. J. Dis. Child.*, 1919, xviii, 93.

For the determination of lactose in human milk the authors employed the titration method based on the reduction of copper in phosphate solution as described by Folin and McElroy. This procedure has an advantage over others in that it obtains the results in a relatively short period of time and with considerable accuracy and only 1 or 2 cubic centimeters of the milk are needed for duplicate determinations. Fat was determined by the methods of Babcock or Bloor, depending upon the amount of milk available. Protein was calculated from the

total nitrogen values obtained by means of the Kjeldahl-Gunning method, using the factor 6.25.

The experimental work consisted of determinations of the composition of the milk (1) at different stages of lactation; (2) at the beginning and end of a single nursing; (3) when the milk was taken practically simultaneously from both breasts; (4) when the milk was taken at three-hour periods during the course of a single day.

The technique employed in collecting the samples was as follows: 1 ounce of milk was expressed or drawn before the infant nursed, the infant was then allowed to nurse the usual time but never longer than twenty minutes, and another ounce of milk was then drawn or expressed after the infant had finished. In this manner samples of both fore-milk and strip-pings were obtained.

The average amount of lactose in 60 samples was 7.19 per cent. The percentage of fat in the milk of different women varied within wide limits, the lowest amount in mixed milk being 1.5 per cent and the highest 9.9 per cent. The protein was found to be highest during the colostrum period and showed a general tendency to diminish as lactation progressed. It was usually over 1.5 per cent up to the fourth week, and after the twelfth week it averaged below

1.2 per cent. As a rule there was more lactose at the beginning of nursing than at the end. The percentage of fat was much greater at the end of nursing than at the beginning. The average difference in fat before and after nursing, however, was less than 4 per cent.

The results obtained from the studies reported are summarized as follows:

There is a rapid increase in lactose during the days when colostrum changes into milk and a further increase as lactation progresses. The reverse is true of protein.

After the colostrum period there does not seem to be any relation between the stage of lactation and the amount of fat in the milk.

There is a higher percentage of lactose at the beginning of a single nursing than at the end. As a rule the percentage of fat is much higher at the end of nursing than at the beginning. In the amount of protein there is very little difference.

Samples of milk which are taken from both breasts of the same woman simultaneously tend to have the same composition but vary in their percentages of fat.

Toward the middle of the afternoon or later the volume of milk tends to diminish. H. K. GIBSON.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Colston, J. A. C., and Waters, C. A.: *The Rôle of the X-Ray in the Diagnosis of Long-Standing Renal Tuberculosis. Bull. Johns Hopkins Hosp.*, 1919, xxx, 268.

Colston and Waters call attention to the progress which has been made in the last decade in the investigation of diseases of the urinary tract, due largely to the use of the cystoscope and ureteral catheter. A differentiation of lesions has been made possible which before that time was impossible.

There is no disease of the kidney which can be more certainly diagnosed by the use of these modern methods than renal tuberculosis. The demonstration of diminution in the renal function, together with the presence of pus cells and of tubercle bacilli in the catheterized specimen of urine collected from one side, leaves no possibility of doubt as to the condition with which one has to deal.

However, while in the majority of cases a diagnosis can be arrived at by the use of these methods, in many instances, especially cases of long duration, cystoscopy and ureteral catheterization are impossible on account of the changes which have taken place in the bladder mucosa. It may be impossible to recognize the ureteral orifices or they may not admit the ureteral catheter. There are also some cases in which extensive ulcerative processes have led to such contracture of the bladder as to prevent the introduction of the cystoscope or render it too painful for the patient to bear. While in many of these cases tubercle bacilli may be demonstrable in the bladder urine, it cannot be determined in which kidney the lesion is located, owing to the fact that the ureters cannot be catheterized and in most cases of renal tuberculosis there are a few definite symptoms referred to the kidney itself.

When it is possible to introduce the ureteral catheter, the diagnosis is usually easy, but there are types of long-standing, chronic tuberculous processes with sluggish ulceration in which only a few pus cells can be demonstrated and tubercle bacilli may not be found even in repeated catheterized specimens.

In some cases in which the disease has progressed to complete destruction of the kidney, terminating in caseation and deposition of calcium salts — the so-called autonephrectomy — the calcium salts will cast a shadow on the X-ray negative varying in density in proportion to the extent of the process. It is in just these cases when, for any of the reasons given, a definite diagnosis cannot be made, that the X-ray will often be the determining factor in the recognition of the lesion.

When the normal kidney substance has been

largely replaced by calcified caseation a complete outline of the kidney and even of the ureter may be seen on the X-ray plate, and in such cases a definite diagnosis can be made immediately without the demonstration of tubercle bacilli and without recourse to ureteral catheterization except to determine the integrity of the opposite kidney.

The authors emphasize the fact, therefore, that it should be a routine procedure to make a plain X-ray examination of the urinary system in all suspected cases of renal tuberculosis before cystoscopy and ureteral catheterization.

When the calcification is limited to a single area in the kidney there may be some difficulty in differentiating this process from calculus, but a critical observation of the density, shape, and position of the shadow will leave little room for doubt. When the kidney has been completely destroyed, the characteristic lobular appearance of the shadows due to the calcified caseous cavities is very definite and is never seen in any other type of kidney lesion.

By means of stereoscopic plates the individual abscess cavities can be clearly distinguished from each other, provided, of course, that the process has been of sufficient duration to produce deposition of calcium salts in the areas of caseation. Calcification of the ureter is rare, but when it does occur, it is characteristic, the ureter showing on the negative as a dense shadow, the calcification involving the upper portion, the lower portion, or even its entire course.

In addition to what is shown by the sclerosis of the ureter itself, a shadow may be cast by the caseous material which is sometimes seen filling the lumen of the ureter and represents the contents of the cavities of the kidneys.

The fact that calcification occurs as a late process in renal tuberculosis and will show an opacity on the X-ray plate has long been known, but the practical value of this simple method has been too little emphasized.

During the past few years several cases of renal tuberculosis have been recognized at the Brady Urological Institute from the X-ray plate alone. To emphasize the value of the routine X-ray examination the authors present a summary of some of the more interesting of these cases.

It has not been the authors' purpose to discuss the very great assistance of the data which may be obtained from the pyelogram and cystogram. In an occasional case, when sufficient information cannot be obtained by other means, a diagnosis can be made by these studies. It has been the practice at the Brady Clinic, however, to refrain from a pyelographic study if a definite diagnosis of renal tuberculosis can be made by the usual methods. There have been

no bad results following this method but it was felt that when the diagnosis was already certain the additional instrumentation was not justified.

As a result of the foregoing discussion the following conclusions have been reached:

1. X-ray studies of the entire urinary tract should be carried out in all cases of suspected renal tuberculosis.

2. In some instances when other methods of examination have failed, a definite diagnosis of renal tuberculosis can be made from the plain X-ray alone, but whenever possible catheterization of the other ureter should be done to establish the integrity of the opposite kidney.

3. The shadows depend entirely upon the amount of calcification which has taken place in the diseased kidney.

4. Various types of shadows may be seen in the plain X-ray of a tuberculous kidney, varying from the indefinite shadows cast by small areas of calcification to the characteristic lobulated shadow which is typical of a completely destroyed kidney.

5. Pyelography and cystography may clear up the situation in some cases but these procedures should not be carried out if a diagnosis can be made by other and more simple methods.

G. E. BEILBY.

Stark, G. W.: *Diagnosis of Renal Colic.* *N. York State J. M.*, 1919, xix, 331.

The author's conclusions, based on a study of 146 cases of renal and ureteral disease, are as follows:

1. Renal obstruction has been very much neglected by the profession.

2. Of the 146 patients the great majority had been seeking aid for from four months to nine years; of these, 96 per cent have been cured; only 11 per cent have had to resort to surgery; in $1\frac{1}{2}$ per cent the results are doubtful, and $2\frac{1}{2}$ per cent have not been cured.

Renal colic is a symptom due to obstruction in the urinary tract, the most common etiological factors being strictures, kinks, accidental tying off of the ureter, stone in the ureter, adhesions, and the pressure of tumors.

The pathologic conditions usually confused with renal colic are appendicitis, disease of the adnexa, gall-bladder disease, duodenal ulcer, peritoneal adhesions, pancreatic disease, lumbago, and neurasthenia.

Any case of abdominal pain in which there is pus in the urine or frequency of voiding or a history suggesting renal colic should be referred to the urologist for examination.

During the routine examination of patients, the author encountered difficulty in passing a No. 6 or 7 ureteral catheter in a large number of cases. Often, however, by using a smaller catheter and re-inforcing it with a wire, he was able to pass the obstruction. As a result the patient was frequently relieved of the obscure pain and gastric symptoms, and if pus and temperature had been present, the temperature usually dropped.

Inferring from this fact that many instances of renal colic are due to stricture of the ureter, the author passes ureteral bougies ranging in size from a filiform to a No. 12 F. These he operates through a water cystoscope, his treatment of pyelitis and similar conditions being based on drainage and irrigation.

The ureter is dilated from two to four points at intervals of five to fifteen days. Following the dilatation, the size of the kidney pelvis is determined by distention with boric acid solution. This having been done, about two-thirds of the amount of a 25 per cent argyrol solution are injected and allowed to drain through the ureter. Should the argyrol fail to remedy the condition, silver nitrate is used. Silver nitrate should never be employed, however, until full dilatation of the ureter has been accomplished. If possible, a No. 8 catheter is passed up to the kidney, the pelvis is washed out with distilled water, and silver nitrate varying in strength from 1 to 4 per cent is then injected. The amount of silver nitrate used is about two-thirds normal capacity. This is then allowed to drain through the catheter. If, for example, 5 cubic centimeters are injected, the catheter is not removed until 5 cubic centimeters have drained back. When infection is the most prominent symptom, lavage is repeated as often as every other day. When obstruction is most marked, treatments are given every ten days.

In the 146 cases of renal and ureteral disease upon which the author bases his findings, over one thousand lavages have been given, and with the exception of a few hours of renal colic, which occurred only in a few cases, there were no unfavorable results. Six patients with essential hæmaturia of from six to fourteen months' duration were cured by kidney lavage. Of twenty-one patients with kidney ptosis, nineteen were symptomatically cured and two greatly improved. Two cases were treated by the methods described following surgical suspension. By forcible dilatation and lavage great relief was obtained from the almost unbearable pain which persisted after the suspension. Eventually, however, both patients were subjected to nephrectomy. Twenty-eight cases of renal pain without pus were apparently cured. Of eight patients with stone in the kidney, five were treated by pyelotomy, two by nephrectomy, and one refused operation. Three patients had stone in the ureter. In two cases the stone was advanced down the ureter by dilatation; in the other case it will be necessary to remove it surgically. There were eighty-four cases of pus kidney with or without obstruction. In twelve, a nephrectomy was performed. One patient, who refused operation, was treated by dilatation and lavage and is apparently well one year later. In another case in which there was pus in the left kidney and a very advanced nymphitis, death occurred one year after treatment was stopped. One patient with double pyelitis is still under treatment; the remaining sixty-nine, as far as the author can learn, have been cured. J. P. O'NEIL.

Rivarola, R. A.: Renal Lithiasis and Calculus of the Bladder in Infancy. (*Quirurgica infantil lithiasis renal y calculos de la vejiga*). *Semana méd.*, 1919, xxvi, 18.

Rivarola refers to a clinical case of bladder calculus in a child.

In Buenos Aires, though the occurrence of vesical calculi does not reach the high figure reported by Bokay in Hungary, the condition is seen frequently in the Children's Hospital. Males are affected more often than females.

Bladder calculus is in reality only one incident of renal lithiasis. The majority of authors are in accord in accepting the theory ascribing its origin to the uric infarct which is observed in the kidney of the new-born infant. This uric infarct, due to the normal physiological surcharge of uric acid in the urine of the new-born, usually becomes disseminated within the early weeks of life. When the urine is not sufficiently solvent, however, all of it may not be removed and its residue may form the nuclei of future stones. It may remain in the kidney pelvis or in the ureter, or may reach the bladder where in infants it is very often found.

The treatment preferred by the author is lithotripsy or litholapaxy when feasible. When the calculus is voluminous or the bladder is infected, he sections the bladder. Both methods have given good results. Following the removal of the calculus attention should be paid to hygiene and especially to the diet.

W. A. BRENNAN.

Braasch, W. F.: Dilatation of the Ureter and Renal Pelvis. *J. Am. M. Ass.*, 1919, lxxiii, 731.

The article deals with dilatation of the ureters and renal pelves as demonstrated by pyelography, special stress being laid upon the dilatation which results from inflammation. Dilatations of the ureter or renal pelvis are ascribed by the author to three etiological factors: (1) mechanical obstruction; (2) infection; and (3) disturbance of innervation. Each of these is demonstrable clinically, pathologically, and by means of pyelography as a distinct entity, although they are often found in combination.

MECHANICAL DILATATION

Continued obstruction in any portion of the urinary tract results in dilatation of the portion above it. In such cases when examined pyelographically the predominant dilatation is found to be in the renal pelvis rather than the calyces or ureter, the pelvic outline remaining comparatively regular. The degree of the dilatation varies and is classified as: (1) early hydronephrosis with broadening of the base of the calyx, increase in the size of the true pelvis, and flattening out of the terminal irregularities; (2) moderate hydronephrosis with broadening of the entire calyx, a greater increase in the size of the pelvis, and resulting change in the angle of insertion of the ureters; (3) large hydronephrosis with partially filled calyces showing as rounded

individual areas, and a diffuse outline of the rounded sac resulting from dilution of the injecting fluid.

In the ureter dilatation is greatest near the point of obstruction and diminishes as it nears the pelvis. Pathologically the great distention of the ureters is as a rule the result of obstruction as inflammatory dilatation rarely attains a greater diameter than 2 centimeters. Clinically, intermittent mechanical obstruction is nearly always accompanied by pain resulting from overdistension of the pelvis and ureter.

INFLAMMATORY DILATATION

At necropsy dilated ureters and pelves are often revealed with no evidence of mechanical obstruction to account for them. The renal pelvis being opened, dilatation of the calyces of variable degree is found, while the walls of the pelvis are thicker than in dilatation resulting from mechanical obstruction. This thickening of the walls occurs also in the ureters which are often tortuous. The dilatation of the ureters, however, seldom exceeds 2 centimeters.

Microscopic examination of such cases reveals evidence of inflammatory changes resulting from infection. There is a greater degree of leucocytic infiltration with more marked connective-tissue changes in the submucosa and serosa and a greater increase in the thickness of the serosa than in dilatation from mechanical obstruction.

Any degree of chronic infection involving the renal pelvis and ureter is followed by dilatation which results either from a change in the tissues and a consequent retraction in the walls of the pelvis and ureter or from necrosis. The extent of such dilatation varies from scarcely recognizable irregularities of the calyces to complete destruction of the renal pelvis, and differs from the dilatation resulting from mechanical obstruction in that it is greatest in the calyces and ureter rather than in the pelvis the outline of which is comparatively irregular.

Dilatation of the ureter resulting from inflammatory changes is greatest at the ureteropelvic juncture and is associated generally with dilatation of the calyces, while in mechanical obstruction the dilatation is greatest at the point of obstruction and least at the ureteropelvic juncture. When there is inflammation of long duration dilatation of the true pelvis to variable degrees results, together with cortical destruction such that a pyelogram may show the cortical areas connected with the true pelvis or dilated calyces by narrow isthmuses. Such destruction often occurs in cases of tuberculous infection, and although strictures of the ureter are often observed in such cases, the ureters are found dilated their entire length and have the characteristic gaping meati when no evidence of obstruction is demonstrable. The portion of the ureter situated in the bladder wall becomes dilated because of involvement in the inflammatory process, the dilatation being the result of contagious infection.

Inflammatory dilatation frequently accompanies

renal stone. In such cases there may be a typical clubbing of the calyces with little or no dilatation of the pelvis and ureter. That mechanical obstruction could not be a factor is evidenced by the fact that the stone is often securely lodged at the end of a calyx. Infection may cause contraction also when it is confined in the renal parenchyma, the resulting cicatricial changes causing diminution in the size of the pelvis. Clinically in the inflammatory dilatation so frequently seen in chronic pyelonephritis the history given is of little or no pain referred to the kidneys, but rather of repeated febrile attacks.

ATONIC DILATATION

Atonic dilatation of the ureter is probably due to some disease in the central nervous system. The dilatation is not confined to the lower end of the ureter but extends to the renal pelvis. While this has been attributed to the backing up of the urine from an over-distended bladder, atonic dilatation often occurs when no residual urine is present and therefore is probably due to the same disturbance of innervation as that affecting the bladder. Such a condition may occur when there is no clinical evidence of any disease of the central nervous system and both ureters may be dilated and the kidneys hydronephritic in the absence of evidence of mechanical obstruction.

The author concludes that: (1) dilatation of the ureter and renal pelvis may occur without mechanical obstruction; (2) the difference between mechanical and inflammatory dilatation as regards their anatomy, pathology, and clinical data are quite marked; and (3) the clinical demonstration of inflammatory dilatation may be of diagnostic value.

H. C. BUMPUS.

Hunner, G. L.: Differential Diagnosis in Stricture and Calculus of the Ureter. *N. York State J. M.*, 1919, xix, 323.

In the past three and one-half years the author has diagnosed and treated about 500 cases of ureteral stricture. There are still many problems to be worked out, most important of which are: (1) The determination of the total reduction of function in cases of bilateral stricture which has persisted sufficiently long to cause injury to the kidneys; (2) the extent of the return of kidney function after dilatation and the relief of the back-pressure; and (3) the working capacity of each kidney in cases of unilateral stricture.

One of the author's conclusions based upon the 500 cases is that ureteral stricture is the cause of more kidney pathology (excluding conditions usually classified as medical) than any other single factor. It accounts for the majority of cases of hydronephrosis and pyelitis, many cases of pyonephrosis, and many, if not the majority, of cases of so-called hæmaturia. As a rule ureteral stricture and chronic urethritis are due to focal infections.

The classic history of pain and its radiation, vesical or rectal tenesmus, nausea, vomiting, etc.,

so commonly associated with stone in the ureter, is not infrequent in cases of ureteral stricture. There may be no temperature at all or it may rise to 103 or 104 degrees. When chills occur in cases of stone or stricture they are considered proof positive that infection is present. The author states that he has never had a case in which chills occurred in the absence of infection.

When a patient gives a history of having passed a stone, but has a continuance or re-awakening of symptoms characteristic of stone, the presence of a ureteral stricture should be suspected. In cases of stone or stricture it is rare that bi-manual examination is negative. If the kidney can be palpated, it is usually found more sensitive than normal. If infection or hydronephrosis is present or there has been a recent attack of colic, the kidney is more sensitive than usual and may be distinctly enlarged. Palpation of the ureter where it crosses the pelvic brim nearly always elicits pain which at times radiates up the kidney but more often extends to the bladder and causes a desire to void. When the stone or stricture is located in the upper pelvis in the region of the bifurcation of the internal iliac artery, the point of maximal tenderness is just below the pelvic brim. When situated on the right side these findings are often diagnosed as appendicitis. Most stones and strictures in women are found in the region of the broad ligament. Women having pathologic conditions in the lower ureter, particularly a trigonitis, often complain of dyspareunia, and this symptom with pain in the region of the broad ligament often leads to a faulty diagnosis of ovarian or pelvic inflammatory disease and results in needless surgery. The peri-ureteritis associated with stricture, often due to focal infection of the lymphatics, may at times be so marked as to be mistaken for stone.

In cases of either stone or stricture the urine may be normal between attacks, but during or after an attack show blood or pus cells or both. The presence of blood in the quiet stage of the condition favors the diagnosis of stone but during the attack of colic the amount of blood in the urine may be as great in cases of ureteral stricture as in cases of stone.

For purposes of differentiation the author molds a spiral wax tip on the catheter and then places small wax rings at every fifth centimeter of the instrument that will enter the ureter. The second ring, 10 centimeters back of the tip is between 3.5 and 4 millimeters in diameter and of spindle shape with long sloping shoulders. If a stone is present its location below the kidney can be determined by the wax rings. If when a shadowgraph catheter alone is used to determine the location of a suspicious shadow, the two shadows are quite separate, it is safe to say that the suspicious shadow is extra-ureteral, but if they are in juxtaposition the patient should be X-rayed at a different angle or examined with a stereoscope or a wax-tipped catheter.

J. P. O'NEIL.

BLADDER, URETHRA, AND PENIS

Phélip, J. A., and Galard, C. de: Phimosis and Disturbances of Micturition in Children (Phimosis et troubles de la miction chez l'enfant). *Arch. de méd. d. enfants*, 1919, xxii, 424.

The authors examined a group of children who had been operated upon for phimosis. In 40 of these cases the operative indication was disturbance of micturition; in 11 others the indication was balanoposthitis. Of the 40 cases of disturbed micturition there was retention in 3, painful and difficult micturition in 12, and incontinence in 25. The authors find that the incontinence which accompanies phimosis is due to a reflex irritation and that usually it is not cured by circumcision. Their clinical observations made a long time after operation have confirmed this fact.

In the 25 cases in which there was incontinence recovery has been complete in only 8. In 5 other cases there was improvement. When the incontinence is nocturnal the prognosis for its cure by circumcision is poor. In many of these cases, in addition to the preputial trouble, there may be other conditions by which the reflex irritation leading to incontinence is aroused. The meatus may be narrow or there may be some abnormal condition in the urethra. Dilatation may be necessary. Circumcision is very effective in all cases of phimosis associated with balanoposthitis, in dysuria, and in urinary retention, and although in cases of incontinence its success is less assured, its indication is formal and clear.

W. A. BRENNAN.

GENITAL ORGANS

Clute, H. M.: Torsion of the Spermatic Cord. *Boston M. & S. J.*, 1919, clxxxi, 231.

Fifty-three cases of torsion of the spermatic cord were collected from the literature by the author. Seventy-six per cent were those of patients 25 years of age or younger and 47 per cent those of patients between the ages of 15 and 25 years. The torsion occurred on the right side more frequently than upon the left.

In cases of torsion the cord is attached to only a small portion of the epididymis instead of its entire length. The remainder of the epididymis and testis lies free in the tunica vaginalis. An abnormally

loose scrotum and large tunica vaginalis have also been considered to be predisposing factors. Murray believes that torsion is due to rotation during the passage of the testis from the kidney to the scrotum. This results in thrombosis during any sudden vascular changes in the cord. If this were true, however, torsion would apparently be more frequent. Unusual labor or injury usually precedes the onset.

The direction of the twist is usually from within outward and downward. The amount of destruction depends upon the degree of the torsion. Below, the vessels are thrombosed with a total infraction of the tissues. Above the blockage there is marked congestion of the vessels. With the exception of one case, the twist was within the tunica.

Clinically there are two types, the acute complete torsion and the acute partial torsion. The symptoms are similar except that those of complete torsion are much more severe. The onset is sudden and characterized by pain in the testis which may radiate upward or down the thigh. There is more or less shock with possible vomiting and later an increase in temperature. Tenderness with gradual swelling and redness follow. In incomplete torsion there are recurrent attacks of pain but these may be very slight. In untreated cases such recurrences are common. Atrophy of the testis has also been reported.

The absence of urethral discharge and negative prostatic and seminal vesicle findings eliminate gonorrhoeal epididymo-orchitis. Torsion of an undescended testis may be simulated by strangulation of an indirect inguinal hernia but the history of undescended testicle should suggest the possibility of torsion.

Detorsion should be attempted although it proved unsuccessful in three cases reported by the author. This is done by twisting the testis in the reverse order of the torsion. Many successful cases have been reported, but it is advised only in the early stages of the condition. If operation is necessary, the circulation in the exposed testis should be re-established if possible by the application of hot towels. If this is unsuccessful, orchidectomy is advised. In recurrent partial torsions, Dowden's method of removing the parietal layer of the tunica, scarifying the visceral layer, and then suturing the testis to the scrotum through the tunica albuginea has been of value.

C. D. PICKRELL.

SURGERY OF THE EYE AND EAR

EYE

Lemaitre, F., and Garmy, A.: The Extraction of Peri-Orbital Foreign Bodies (De l'extraction des corps étrangers péri-orbitaires). *Ann. d'ocul.*, 1919, clvi, 265.

By peri-orbital foreign bodies the authors mean foreign bodies situated in the immediate vicinity of the orbit. In relation to the orbit they are internal superior, external, inferior, or posterior.

The operation known as a paralateral rhinotomy gives access to all internal and some posterior peri-orbital foreign bodies. It also gives access to the ethmoid and sphenoid regions. Eight cases were operated upon by this route.

The incision in the sinusofrontal route is the classical incision between the sinus and the frontal bone. It permits the extraction of intracranial and intracerebral foreign bodies situated back of the sinus and back of the frontal bone. Four cases were operated upon by this route.

Projectiles in the temporal peri-orbital region often appear to be superficial when in reality they are deeply embedded. The temporal shell, which is very fragile here, yields to the least traumatism. In 2 of 3 cases of injury to the temporal bone the dura mater was involved. The temporal route may be utilized for the extraction of foreign bodies in the cerebrum behind the orbit.

The vestibular route by simple opening of the mucosa and without any extensive incision leads to all the deep cavities of the face. There are three varieties: the simple sinusal route; the transsinusal route prolonged toward the pterygomaxillary fossa or the ethmoid; and the laterosinusal vestibular route. The last named was not used before the war. It leaves the sinus intact and gives access to the retromalar region. Four cases were operated upon by the vestibular route.

The authors have operated upon a total of 23 cases of war injuries and give concise case reports of 10 of them which are typical.

W. A. BRENNAN.

McReynolds, J. O.: Foreign Bodies within the Eyeball. *J. Am. M. Ass.*, 1919, lxxiii, 818.

The author discusses this subject under three headings, viz., the location and character of the foreign body, measures for relief, and immediate and remote results. He reports eleven cases illustrative of various important features in the extraction of foreign bodies from the eyeball.

The most difficult foreign bodies to localize are those which are not opaque to the roentgen rays, too minute to cast a perceptible shadow, or non-magnetic. In these cases the history may be of the greatest value. Small aseptic bodies penetrating

entirely through the eyeball and lodging in the retrobulbar cellular tissue usually give rise to no future trouble. The occasional presence of postocular hæmorrhage with proptosis may serve to locate a foreign body as without the globe. The reaction produced by the foreign body is greatly influenced by its chemical nature, e.g., glass is practically inert, while copper produces a prompt and decided response. The bacteriological status of a foreign body is its most important feature in this regard, and much depends upon the virulence of the organisms.

In undertaking the removal of a foreign body from the eyeball it is of the greatest importance to decide wisely whether the anterior or the posterior route is to be adopted. In general, the author prefers the latter method, owing to the dangers of iridocyclitis with possible transferred ophthalmitis, and his experience has emphasized the safety and practicability of removing foreign bodies through a scleral incision by this route whenever they are easily accessible. The anterior route is most suitable for cases in which the foreign body is small and situated in the anterior segment of the globe.

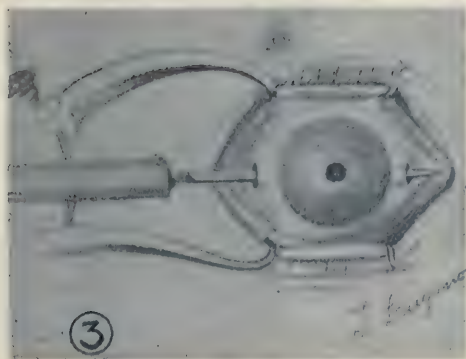
The immediate and remote results must be considered also with regard to the other eye. In general terms, the immediate result in the injured eye will be favorably influenced by accurate localization, early removal of the foreign body, the minimum of traumatism by the flight of the missile and the subsequent operative procedure, the non-involvement of the ciliary body, the lens, and the macula region, and the negative chemical and bacteriological character of the foreign body. The remote results are often disappointing because of late complications, such as sympathetic ophthalmia, retinal detachment, and other late degenerative processes.

In two of the reported cases the foreign bodies were so minute that they cast no shadow on the plate. They were visible, however, with the ophthalmoscope. In three cases the injuries were extensive and associated with infection. In three cases the intra-ocular application of magnetic electrodes was necessary. In one case there was a puncture wound without retention of the foreign body within the globe.

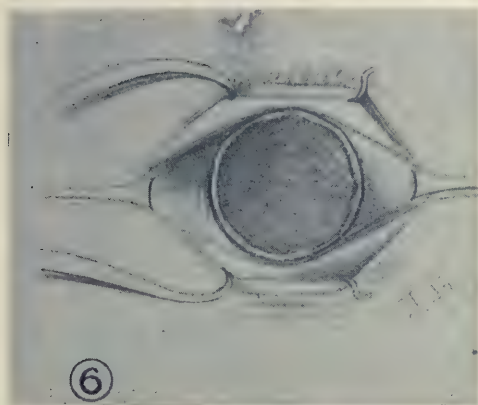
W. F. MONCREIFF.

Dimitry, T. J.: An Operation Relegating Enucleation of the Eye to Its Proper Position. *Am. J. Ophth.*, 1919, ii, 653.

Dimitry describes a technique which has given him good results in a series of twenty cases. His operation is advanced largely for cosmetic purposes and in the large majority of cases he believes it should supplant the operation of enucleation. Enucleation he deems a simple mechanical measure in which muscles are cut loose from their attachment to



Transfixed with Graefe knife.



Anterior segment excised.



Scleral cavity emptied.

the eye, the optic nerve is severed, the eye is delivered, and hæmorrhage is controlled by pressure. When, after a varying period of healing, a prosthesis is to be inserted, it is almost certain that three highly unsatisfactory conditions will be present. There is a deep socket which is not comparable to that of the opposite eye, the lids sag, and the eye stares rigidly out into space. These deformities are inexcusable and can be avoided. Enucleation is permissible, however, in cases of malignant disease and in the aged when there is need for an operation that can be performed rapidly.

The treatment advanced by the author practically obviates injury to the sympathetic nerve, conserves the normal movements of the eye, provides a foundation for the prosthesis, and exposes the patient to no greater risk than enucleation. Moreover, it eliminates the troublesome sympathetic iridocyclitis better than substitute operations for enucleation, a fact of which the author is now more firmly convinced than ever.

The operation consists in an evisceration of the sclera and the removal of a section of it posteriorly, including severance of the optic nerve. A gold ball

is then inserted within the sclera and the anterior opening is closed. The latter feature is regarded highly essential.

The technique is described as follows: The operation is begun as an evisceration, the conjunctiva being undermined. The anterior aspect of the globe is then resected, the point of resection being about 2 millimeters posterior to the corneoscleral margin. The contents of the globe are removed and the hæmorrhage is controlled. Section of the sclera over the region of the optic nerve head in the posterior aspect of the sclera is made from within and the optic nerve is severed. The latter is done with a Graefe knife and a pair of curved scissors. The sclera is turned outward and every vestige of choroidal tissue removed. Two small triangular sections of the sclera are removed at both sides of

the anterior window and in such position that a horizontal line bisecting the latter will also bisect the triangular openings. The gold ball is then inserted and the sclera sutured over its anterior surface. The conjunctiva is sutured to the capsule of Tenon at the position of its attachment to the sclera and hence is not brought over the sutured anterior wound in the sclera. This finishes the operation.

In the author's twenty cases the operation was performed under general anæsthesia in eighteen and under local anæsthesia in two. Two cases date back five years, 4, four years, 4, three years, 5, two years, and 5, one year.

Implantation of other substances than a gold ball, such as fat, cartilage, the eye of a rabbit, paraffin, and dental wax has been tried and found unsatisfactory.

The conclusions drawn are as follows:

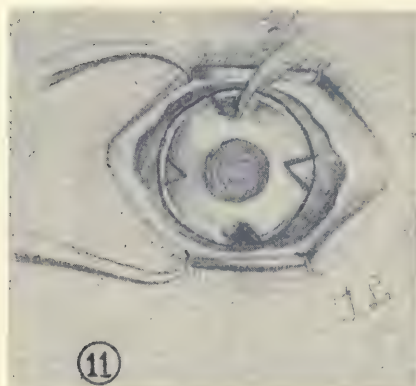
1. The operation described may be performed with a comparative absence of trauma and hence is followed by less reaction, less secretion, and less ecchymosis and there is less likelihood of injury to the sympathetic, than is the case when enucleation is done.



Cutting window in back of sclera.



Dividing optic nerve.



Cutting triangles out of sclera.



Schematic section showing gold ball inserted—window in back of sclera—optic nerve cut—conjunctiva sewed to Tenon's capsule, not over sclera.

2. It furnishes a filled-in socket with its several advantages: a firm seat for the prosthesis; an absence of sagging lids, and hence a normal lachrymal secretion and drainage.

3. It evidently does not interfere with a natural face development in the young.

4. It leaves the recti muscles undisturbed and with an unimpaired power to function.

5. The posterior window which permits the easy severance of the optic nerve and ready absorption of hæmorrhages and exudates obviates extrusion of the gold ball.

6. The retro-attachment of the conjunctiva furnishes a deeper retrotarsal fold which allows unrestricted excursions of the prosthesis. J. S. CLARK.

Márquez Colomo and Soria: An Advance in the Medical Treatment of Cataract (Avance para el tratamiento medico de la catarata). *Med. Ibero*, 1919, Número extraordinario, 1 Cong. de med. y cirug., 93.

The future of the treatment of cataract lies along medical lines; not those based upon the discredited

agents, chiefly iodides, which have been used heretofore, but those having their basis in recent discoveries in immunotherapy and the application of the theory of antigens and antibodies.

The authors successfully immunized a donkey by repeated intravenous and subcutaneous injections of an extract of the crystalline lens of an ox (the crystalline albumin being alike in practically all species of animals but distinct from the albumins of the other organs even in the same species), and in this way obtained a phakolytic serum which by complement deviation and experiments on rabbits was demonstrated to be very rich in antibodies.

In the experiments reported a traumatic cataract was provoked in one eye of each animal of a number of pairs of rabbits with a discission needle. This was then followed by the injection of the phakolytic serum into the traumatized eye of one animal of each pair. It was found that resorption of the cataract occurred with greater rapidity in the eyes which were treated with the serum.

While the authors admit that these results do not as yet definitely prove that a successful method of

medical treatment of cataract has been attained, they believe they constitute an important advance in that direction and show that it is possible to obtain a phakolytic serum which increases the rapidity of resorption of a traumatic cataract or of the opaque masses resulting from a secondary trauma. The production of antibodies following the injection of the crystalline lens of animals or of an emulsion of human cataracts was demonstrated also by investigations carried out years ago by Megías, Moreno de Vega, and Sánchez Grúas at the suggestion of Márquez.

The basis of the work here reported and of the former investigations was a fact observed by Márquez in the case of a patient upon whom he performed two operations for cataract. In the first few days following the second operation crystalline masses which had persisted without resorption in the eye formerly operated upon rapidly disappeared. This could be explained rationally only by the assumption that during the second operation specific antibodies were produced which reached the opposite eye through the circulation and were the cause of the absorption of the masses.

Márquez suggests that possibly in immunizing with phakolytic serum as an antigen an anti-phakolytic serum might be obtained which would protect the crystalline lens against the factors causing cataract.

M. M. MATTHIES.

Weill, G.: Lance Extraction of Senile Cataract (Extraction de la cataracte sénile à la pique). *Ann. d'ocul.*, 1919, xlii, 338.

The principal objection to the lance extraction of senile cataract has been that the incision is insufficient to permit the extraction of large cataracts.

The author believes that this difficulty may be overcome by enlarging the wound from the anterior chamber, not as in Weber's procedure, but by prolonging the incision in the limbus as is often done in an iridectomy with the lancet.

The author has used the lance extraction since 1912 and his results have been so good that he no longer uses the Graefe knife. In his earlier cases he also performed an iridectomy, but in subsequent cases this has been omitted. Altogether he has removed about 400 senile cataracts of all types.

The lancets used are curved and vary from 8 to 11 millimeters in width. The instrument is withdrawn parallel to the diaphragm of the iris and in this manner the incision in the limbus is prolonged to the extent desired; otherwise the Graefe operation is followed.

Weill sums up the advantages of the lance extraction as follows:

1. The incision, which requires neither counter-puncture nor saw movement, is much easier.
2. The form of the lance and its introduction from the periphery toward the center of the anterior chamber prevents the flow of the aqueous humor and also keeps the iris from becoming caught in the knife cut.

3. The iris regains its place spontaneously or following simple massage of the cornea and rarely tends to become involved in the wound.

4. The anterior chamber is re-established much more quickly than after incision with Graefe's knife.

5. Postoperative astigmatism is less pronounced, the edges of the wound being much more regular and evenly united.

W. A. BRENNAN.

EAR

Harris, T. J.: Acute Mastoiditis: a Clinical Study Based on Cases Seen in the Otolaryngological Service, U. S. General Hospital 14, Fort Oglethorpe, Ga. *Laryngoscope*, 1919, xxix, 540.

Harris discusses the aural complications of measles and influenza. Concerning his experience with acute affections of the middle ear and mastoid following measles he offers the following deductions:

1. Otological complications are so unusual in their symptomatology that the only certain means of recognizing them is the routine examination of the ear itself.

2. Far outweighing all measures for the relief of infection of the ear are prophylactic measures such as improved sanitary procedures and the local treatment of the upper respiratory tract by means of gargles of warm saline, Dobell's solution, or a 2 per cent solution of dichloramine-T. The establishment of steam huts may also be of great service.

Concerning the aural complications of influenza the following points are discussed:

1. The drum picture. The presence of the characteristic hæmorrhage bleb is noted.

2. The impossibility of placing much reliance on drooping of the posterior superior canal wall as an indication for operative interference.

3. The thickening of the periosteum over the mastoid which is a valuable aid in the diagnosis.

4. The great value of the roentgenoscopic findings which, however, are not infallible.

5. The variation in the operative findings. Little or no change was noted in mastoids which were opened early.

6. The lack of uniformity in the nature of the organism recovered.

7. The marked slowness in the time of healing.

O. M. ROTT.

Kelly, J. D.: Acute Otitis Media Purulenta and Acute Mastoiditis at the Base Hospital, Camp Stuart, Va. *Med. Rec.*, 1919, xcvi, 408.

Kelly offers the following conclusions from his study of nearly two hundred cases of acute otitis media purulenta and forty-eight cases of acute mastoiditis at the base hospital, Camp Stuart, Virginia:

1. It is very difficult to obtain a pure culture or to determine the identity of the causative organisms in acute purulent otitis media.

2. Invariably after twenty-four hours of discharge the cultures are mixed cultures.

3. The presence in a discharge of virulent pyogenic organisms does not necessarily mean that mastoid involvement will follow.

4. The individual anatomical characteristics of the mastoid may not be a deciding factor in the development of mastoiditis.

5. In acute purulent otitis media syringing should never be done with the hope of irrigating the middle ear. Treatment should consist in free drainage with or without wicks, the canal being kept free from obstruction. A piece of absorbent cotton may be placed in the auricle to absorb the secretion and the ear covered with a handkerchief or bandage.

6. The X-ray in acute mastoiditis is not to be depended upon for diagnosis.

7. Acute purulent otitis media lasting over three weeks and discharging freely at that time invariably means mastoid involvement and should receive operative treatment in order to preserve the hearing and protect against chronicity of the condition.

8. A complete exenteration of all possibly affected cells should be done at the time of the operation.

O. M. ROTT.

Guthrie, D.: Aural Suppuration in Early Childhood: Its Prevention and Treatment. *Lancet*, 1919, cxcvii, 429.

Aural suppuration occurs very frequently during the first year of life. The anatomical structure of the membranous meatus and the position of the tympanic membrane, together with a relatively short, wide, and more horizontal eustachian tube, favor infection of the middle ear from the nasopharynx.

Postmortems performed on infants by different observers have shown that otitis is present in approximately 82 per cent. The pus found in ears so affected yielded the pneumococcus in most cases, and next in frequency, the streptococcus. Only rarely was it sterile.

The ears should be examined in infants who are suffering from fever of obscure causation. In otitis media the temperature may be high or may not rise above 100 degrees. Pain is evidenced by continuous crying, restlessness, sleeplessness, and boring of the head into the pillow. The pain is not constant, however, and sometimes may be altogether absent. Otoscopic examination is extremely difficult in young infants with otitis media. Often a fleeting glimpse is the best obtainable. Mastoiditis is not a very common complication.

Treatment consists of the use of dry heat and cocaine, carbolic and glycerine drops in the early stages. Paracentesis may be performed.

Tuberculosis of the middle ear was found by the author in 13 of 150 consecutive cases of chronic middle-ear suppuration in children under 10 years of age. In all of these 13 cases except one, a child aged 3, the disease began during the first year of life. Ten of the children were bottle fed and in only one instance was the milk boiled. There is little doubt that the infection was milk borne.

The treatment of tuberculosis of the middle ear in children consists of a very radical mastoid operation. This was done in 9 of the author's 13 cases and the nature of the disease confirmed by microscopic examination of the granulations. Six of the patients did well and 3 died, one of meningitis one week after the operation. The other deaths, which occurred several months later, were due to pneumonia and convulsions respectively.

Otitis media in children of 2 years or over tends more and more to approach the adult type. The disease is probably as common between the ages of 2 and 6 as after 6.

Medical reports in Scotland show that 1.3 per cent of children entering school have discharging ears. In 66 of 130 cases of aural suppuration in children aged from 1 to 10 the etiological factor was determined as follows: measles, 31 per cent; scarlet fever, 6 per cent; pneumonia, 6 per cent; whooping cough, 5 per cent; injury, 2 per cent; and diphtheria, 1.5 per cent. The small number of scarlet fever cases arises from the fact that two-thirds of the patients had not reached the age at which scarlet fever obtains its maximum incidence. Measles is a more disabling disease than scarlet fever and its danger as a cause of chronic middle-ear suppuration cannot be too strongly emphasized.

A second and perhaps the most important factor of all in the production of middle-ear suppuration in children is adenoids. Adenoids are responsible not only for the origin of otitis but also for its chronicity. The adenoid operation, therefore, has an important place in the prophylaxis as well as the treatment of ear suppuration. The following scheme of treatment may be a useful guide in average cases: (1) cleansing and antisepsis; (2) removal of adenoids; (3) conservative mastoid operation; (4) radical mastoid operation. The first is carried out by the use of "mopping and drops" rather than syringing. If the suppuration should continue after two or three months of such treatment carried out systematically and after the adenoids have been removed, a conservative mastoid operation should be chosen whenever possible.

W. L. BENEDICT.

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SURGERY OF THE EYE AND EAR

Eye

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Ear

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Aural suppurative in early childhood: its prevention and treatment. D. GUTHRIE. *Lancet*, 1919, cxcvii, 420. [68]

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Acute otitis media purulenta and acute mastoiditis at the base hospital, Camp Stuart, Va. J. D. KELLY. *Med. Rec.*, 1919, xcvi, 408. [67]

Acute mastoiditis: a clinical study based on cases seen in the otolaryngological service, U. S. General Hospital 14, Fort Oglethorpe, Ga. T. J. HARRIS. *Laryngoscope*, 1919, xxix, 540. [67]

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SURGERY OF THE NOSE, THROAT, AND MOUTH

Nose

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Nasal sinus disease in infants and young children, including bacteriological study. L. W. DEAN and M. ARMSTRONG. *Ann. Otol., Rhinol. & Laryngol.*, 1919, xxviii, 452.

Suppuration of the frontal sinus and its complications. W. D. BLACK. *J. Missouri M. Ass.*, 1919, xvi, 298.

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Acute adenoiditis in first and second infancy. R. RAIMOND. *Presse méd., Par.*, 1919, xxvii, 462.

Throat

■Pneumococcal ulceration of the pharynx. B. FOSTER. *Med. J. Australia*, 1919, ii, 262.

The complete extirpation of the larynx in carcinoma. T. HOSHINO. *Ann. Otol., Rhinol. & Laryngol.*, 1919, xxviii, 466.

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Mouth

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Technique for the removal of dead teeth. J. NOVITSKY. *California State J. M.*, 1919, xvii, 314.

INTERNATIONAL ABSTRACT OF SURGERY

FEBRUARY, 1920

ABSTRACTS OF CURRENT LITERATURE GENERAL SURGERY—SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE

Sharpe, N. W.: An Occurrence of Rapid Absorption of Catgut Sutures in the Light of a Possible Balance Existing between Digestion and Encapsulation Processes in the Attack upon a Foreign Protein. *Mil. Surgeon*, 1919, xlv, 436.

During an operation for recurrent appendicitis on a soldier who gave a history of trouble which had continued for ten or twelve years a very dense Jackson's membrane was found covering the terminal ileum, the cæcum, and the proximal colon. This was dissected off and the adherent retrocæcal appendix was removed. The abdominal wall was closed in tiers with silkworm-gut tension sutures and subcuticular No. 3 catgut without drainage. Tympany, griping, and vomiting followed the operation but were relieved by ordinary measures. On the fourth day there was complete diastasis of the skin and superficial fascia and the subcuticular catgut was found to have been completely digested. The skin edges were then re-united with a running double No. 3 catgut suture and the tension stitches removed. The next morning this double catgut suture was completely digested.

Experimental studies by the author and Pohlman on the fate of alien protein in the tissues demonstrated that there are three definite processes associated with its disposition: (1) a proximal digestion zone contiguous to the foreign body (lymphoidal cells), (2) an intermediate zone (largely endothelial leucocytes), and (3) a distal encapsulation zone (fibroblasts).

The digestion cells appear to attack the foreign protein by enzymes and are stimulated by the end-products of digestion. The intermediate cells serve as carriers which transport undigested particles through the zone of encapsulation into the lymphatic stream. The cells of the outer zone of encapsulation seem to be inhibited in the production of definite scar tissue by the seepage of digested material produced by the enzymic action of the

lymphoidal cells of the digestion zone upon the foreign protein.

In the absence of serial sections of the tissues in the case cited, however, it is not justifiable to affirm more than that in this instance the unusually intense and rapid digestion was due to an unusual biochemical status.

E. M. MILLER.

ANÆSTHETICS

Routh, L. M.: Surgical Anæsthesia amongst British Troops in the Tropics (India). *British M. J.*, 1919, ii, 464.

In discussing anæsthesia as induced in India the author describes the temperamental characteristics of the patients, nearly all of whom were young soldiers who had been under severe nervous strain. Such persons he considers poor subjects, preferring the full-blooded phlegmatic type. Other factors which render these patients poor subjects for anæsthesia are the poor quality of their food, the excessive use of tobacco which predisposes to tachycardia and cachexia, and the lack of athletic sports which affects the general physical condition unfavorably.

In the author's opinion a mixture of 3 parts of ether and 1 part of chloroform given by the open method is the anæsthetic of choice. Chloroform he believes is a dangerous drug and should be used only in operations requiring Junker's inhaler. A preliminary injection of $\frac{1}{4}$ grain of morphine, and $\frac{1}{100}$ grain of atropine should be given one-half hour before operation and the patient then wheeled to the operating room on a stretcher.

In the tropics the patients appear to go under the anæsthetic as easily as in England, but there is danger in the induction stage, especially if there is struggling. The tendency to cardiac and respiratory failure is greater than in England, probably because of the climate and the patients' high nervous tension.

A light anæsthesia is possible. As sweating is profuse, there should be no fan in the operating room.

In combating shock pituitrin has been used more frequently in India than in England and with good results.

Postanæsthetic vomiting is rare and the author has not observed any cases of postanæsthetic acidosis or delayed poisoning.

Nitrous oxide and ethyl chloride are little used in India; the latter is too volatile.

In conclusion the author states that the main points in inducing anæsthesia are care, continual watching of the patient, the maintenance of an even anæsthesia, and the use of a suitable anæsthetic mixture.

J. A. H. MAGOUN, JR.

Green, G. W.: Spinal Anæsthesia in General and Genito-Urinary Surgery. *Illinois M. J.*, 1919, xxxvi, 171.

The author summarizes the effects of spinal anæsthesia and quotes Babcock who, with an experience based on over 5,000 cases, says: "Spinal anæsthesia requires a more highly developed technique and a greater degree of watchful supervision than does the use of ether." It is stated also that spinal anæsthesia is relatively safer in the young and robust than in the enfeebled and toxic.

In 6,229 cases of spinal analgesia induced by twenty-seven physicians in the Government Hospital of the Republic of Panama, the majority of the patients were negroes of the West Indies and Panamanians of the poorer classes, of low mentality and by no means of a neurotic tendency. They submitted to operation with little mental distress, a factor which is of great importance in the induction of spinal anæsthesia.

The most consistently good results are obtained with the following preparation:

Ampule.....	0.5 c. c.	I	c. c.
Stovaine.....	0.05 gm.	0.1	gm.
Sodium chloride.....	0.05 gm.	0.1	gm.
Distilled water.....	0.5 c. c.	I	c. c.

In 226 consecutive cases injected by a physician with large experience in the use of the method, there were 2 failures, 1 complete and 1 partial (about 0.8 per cent). In 479 cases injected by 6 physicians, there were 16 complete failures, 9 partial failures, and 4 repeated injections.

On 3 occasions it was necessary to stop the operation temporarily on account of respiratory failure.

Following the operation, mild headache and backache occurred in about 20 per cent of the cases. This was due to slight hæmorrhage into the subarachnoid space from faulty puncture.

Temporary loss of control of the bladder is fairly frequent following operations on the rectum and perineum.

There were 4 deaths in which spinal analgesia had been a factor, but in only 1 instance did it seem to be the sole cause of death.

Special skill is required for the successful use of spinal anæsthesia, particularly in its selective field.

THEODORE DROZDOWITZ.

SURGICAL INSTRUMENTS AND APPARATUS

Chambers, F. S.: A New Appliance for Flail Elbows. *Mil. Surgeon*, 1919, xlv, 440.

During the recent war there were a number of cases in which a flail elbow resulted from extensive resection of the joint. Those seen by the author were characterized by loss of the capitellum, trochlea, and part of the humeral shaft. Voluntary flexion varied with the amount of humerus that was lacking and was often painful, due to pressure on soft parts between the bones.

The appliance recommended to stabilize such joints consists of two fulcrum pads shaped like an inverted "L" which make pressure above and in front of the head of the radius and along the inner edge of the ulnar articulation. These pads are sewed on metal, are thick enough to prevent pressure of the metal on the bones, and are fastened to two flat hinged metal bars which pass along either side of the fore- and upper arm. They are held securely by a leather collar around the arm at the lower axillary border and the forearm near the wrist and are attached just below the hinges so that they move with the forearm and maintain a constant relation to the radius and ulna. The method of making and applying the apparatus is described in detail. Too much should not be expected when it is first used, however, as muscular atrophy must be gradually overcome. Massage and electricity may be of great aid.

In some cases in which regeneration of bone interferes with the coronoid process during flexion the apparatus is of little value. When the radial head and ulnar articulation are missing, the fulcrum pads must be oval and placed just above the ends of the bones. If the bicipital tubercle or the coronoid process of the ulna is lost, the results will be unsatisfactory.

E. M. MILLER.

Everidge, J.: A Model to Demonstrate the Methods Carried Out in the Mobilization Treatment of Knee-Joints. *Proc. Roy. Soc. Med.*, Lond., 1919, xii, Clin. Sect., 10.

The arrangement described is applicable to cases running an aseptic course after operation and was designed to obtain an increasing range of passive movement which can be kept under accurate control so that the risk of tearing apart structures sutured at the primary operation is eliminated. When these structures have healed, the apparatus can be arranged for active motion.

For the treatment of suppurating knee-joints the limb is placed on a hinged back splint with a modified McIntyre foot-piece. The splint is partially counterpoised and beneath the foot-piece it is fitted with running wheels. Active movements are carried out with greatest ease and as the force of gravity is neutralized by the counterpoising system, the patient's strength is not wasted in purposeless effort to raise the leg from the horizontal position.

The series of cases treated with this apparatus included over a hundred aseptic cases and twenty-three in which there was suppuration. In eleven of the latter a good mobile knee-joint was obtained.

E. M. MILLER.

Kazanjian, V. H.: Prosthetic Appliances in the Surgical Treatment of Wounds of the Face and Jaws. *J. Am. M. Ass.*, 1919, lxxiii, 1265.

As a rule maxillary splints are anchored in the teeth and the alveolar ridges. The retention depends on the security and the method of attachment, while the type of splint to be employed in a given case is determined by the position of the teeth relative to the fracture.

When the teeth will not afford sufficient fixation of the fragments this may be gained by one or more of the following methods: (1) the adaptation of the splints entirely to the alveolar ridges; (2) the use of external appliances which acquire their support from the cranial bones; or (3) sutures.

It is not possible to foretell the regenerative powers which will be manifested by the tissues under careful treatment; severe comminution does not necessarily imply non-approximation of the fragments.

Fractures of the jaws cannot be treated independently of the wound of the face, and in bringing about the repair of both hard and soft tissues due regard must be given to each in the construction of mechanical devices. Mechanical and surgical techniques are inseparable and even radical changes are frequently indicated in the splints or other appliances. The mechanical devices used on the soft tissues are intended primarily to direct the course of recovery rather than to correct the deformity. A satisfactory means of averting undue contraction is gentle pressure applied to the facial tissues during the early course of healing. Intra-oral appliances will keep the tissues from forming adhesions to the alveolar ridges and maintain the contour of the face, lips, or nose from within.

Kazanjian classifies fractures in relation to mechanical forces governing the construction of splints as follows:

I. Mandible.....	1. Anterior to the last tooth present	(a) No loss of tissue
	2. Posterior to the last tooth present	
	3. Edentulous	
II. Maxilla.....	1. Fracture of alveolar process and teeth	(b) Comminution
	2. Partial fracture (s) with or without comminution and partial loss of bone	(c) Multiple fractures
	3. Complete fracture with or without loss of bone	(d) Distinct loss of tissue
III. Mandible and maxilla.....	{ The foregoing conditons in combination	

Each class of fracture is considered separately with regard to the proper method of treatment and the various fractures and appliances are illustrated by 13 figures.

C. R. STEINKE.

LeMesurier, A. B.: The Use of Orthopedic and Prosthetic Appliances in the Late Treatment of War Disabilities. *Med. Quarterly*, 1919, i, 179.

The more common disabilities that lend themselves to treatment by appliances may be divided into four classes: (1) nerve injuries, (2) disabilities of the joints, (3) disabilities of the feet, and (4) amputations.

In nerve cases appliances are used for the treatment of paralyzed muscles. Their purpose is to prevent even momentary over-stretching of paralyzed muscles in cases in which the return of function may be expected, to prevent or correct deformity caused by contraction of the unparalyzed opposing muscles, and to hold the limb in the best position for function.

The disabilities of the joints that lend themselves to treatment by appliances fall into two main classes.

The first class comprises the cases in which there is a lack of stability following injury to the ligaments or bones or excision of a joint. The second class includes cases in which there is stiffness of a joint, short or bony ankylosis, and it is desired to increase movement. This stiffness may be caused by fixation of the muscles above by a large scar—a condition most frequently seen following wounds of the upper arm and thigh complicated by a fracture—or by adhesions in a contraction of the capsular and other ligaments following inflammation or prolonged fixation.

Most cases of foot disability due to military service are cases of weak foot or flat foot. Varying degrees of this condition are observed. If the foot has a tendency to rotate inward, the shoe heel should be flanged and raised $\frac{1}{2}$ inch on the inner side. If the arch of the foot tends to break and flatten, it should be supported by carrying the heel of the shoe forward about $\frac{3}{4}$ inch on the inner side.

When the valgus deformity is marked, and particularly when it is due to a badly united fracture about the ankle, an ankle brace may be worn. This consists of a single upright bar passing up the outer side of the leg between the heel of the shoe and a band around the calf.

A second large class of cases requiring treatment by modified shoes are those in which on pressure on the sole there is pain over the heads of one or more of the metatarsal bones. Great relief may be obtained by the use of the metatarsal bar, $\frac{3}{16}$ or $\frac{1}{4}$ inch thick and $\frac{3}{4}$ inch wide which is placed obliquely across the bottom of the sole, parallel to, and well behind, the line of the heads of the metatarsal bones.

In amputation cases there is always a certain amount of œdema present when the stump first heals. A shrinking of the stump occurs when this subsides and the muscles waste. Following an amputation of the lower part of the leg a peg-leg should be worn as soon as possible. For amputations of the thigh, the standard peg consists of a padded ring like that of the Thomas splint which grips

the stump just below the ischial tuberosity on which all the weight is borne.

The tendency in the manufacture of artificial arms is toward simplicity and lightness. For work, in cases of amputation above and below the elbow, the working arm is used. In its simplest form this consists of a leather bucket for the stump which is

kept in position by a suitable harness and is fitted with a hook at its end.

Much ingenuity has been shown in devising special terminal appliances for artificial arms. These appliances are useful, however, only to those whose work consists in the frequent repetition of a single act.

L. C. DONNELLY.

SURGERY OF THE HEAD AND NECK

HEAD

Jefferson, G.: Gunshot Injuries of the Scalp, with Special Reference to the Neurological Signs Presented. *Brain*, 919, xlii, 93.

Jefferson records the clinical histories and neurological signs presented in a series of 54 unselected cases of scalp wounds due to gunshot injuries. In none of these cases was a fracture found either at operation or the X-ray examination but the signs and symptoms of intracranial disturbance were present in all but 5. This fact demonstrates the well-known resilience of the cranial capsule which permits distortion to a degree sufficient to injure the subjacent brain without serious injury to the calvarium.

Jefferson divides the cases into two classes, the first including those in which there are signs of a general or concussion nature, the second, those in which a local cerebral contusion can be detected as well. It is notoriously difficult to establish a diagnosis when the wound overlies a silent area, but about 44 per cent of this series gave evidence of localized injury.

Of the general signs observed headache was the most frequent. This was "fixed," and in 45 per cent of the cases severest in the region below the wound. Usually, however, it resolved into a frontal ache which was worst in the evenings. Nausea and vomiting occurred in a number of cases, but next to headache an increase in the tendon-jerks was the most common sign. The arm was less often affected in this way than the leg, and then only in the more severe cases. A few beats of ankle clonus present on one side only may be a valuable sign.

A series of 13 contusions of the motor cortex are analyzed which are interesting because it is only in non-perforating wounds such as these that one can be sure that the injury is limited to the cortex itself and that there is no disruption of the subcortical fibers. The fact that most of the localizing signs rapidly cleared up without residual palsy or anesthesia seems to show that the pathologic anatomy of these contusional cases is little more than a cortico-meningeal hæmorrhage, although it is known that a superficial disorganization may occur beneath an intact skull. The common motor syndrome was a face-hand palsy, the elbow and shoulder being spared. When the wound was on the left side, a motor aphasia was added. Two interesting examples

of contusion of the parietal field with pseudoradicular anesthesia of the hand and forearm are described. In 3 cases there were Jacksonian fits. In 1 of these an extradural clot was found, the calvarium being uninjured. The other 2 were controlled by lumbar puncture and large doses of bromide. Reference is made to the protracted nature of some of the fits seen in head injuries, and the relationship of Kozhevnikov's syndrome. Contralateral motor injury was noted in 4 cases.

Of 4 contusions of the visual cortex there was a persistent scotoma in only 1. In injuries of the area striata nothing may remain at the end of a week or ten days of what was at one time a definite clinical entity.

Jefferson concludes that cerebral injury in the so-called "simple" scalp wounds is far more common than is generally believed. Careful neurological examinations are rarely carried out on these cases, and the brain injury is usually overlooked. A moral may be drawn from these findings with regard to the assessment of pensions, for while the injury to the hairy scalp may have been in itself a trivial thing, the brain may have suffered an injury of no little moment, and this possibility must be given full consideration in the medical discussion of such injuries.

Wilensky, A. O.: Fracture of the Skull and Its Neurological Manifestations. *Ann. Surg.*, 1919, lxx, 404.

Wilensky reviews 75 cases of fracture of the skull studied at the Mt. Sinai Hospital. The greatest number occurred in children and involved the parietal region of the skull. The range of variation of symptoms was very wide. Vomiting was very frequent and usually occurred within a few minutes of the injury, but was rarely repeated to any great extent and did not last longer than the first twenty-four hours. Headache was nearly always present and as a rule of a diffuse variety. Dizziness was unusual.

Loss of consciousness was a fairly constant symptom and corresponded to the presence and degree of concussion and compression, or of both, either co-existing or succeeding one another. Consciousness was recovered very quickly, or more slowly, or only temporarily to pass into a deeper stupor or coma. A deep coma or stupor with stertorous breathing and with beginning involvement of the circulation

is a matter of grave concern since it indicates disturbances in the vital medullary centers.

It was not unusual to observe abnormal neurological phenomena in cases in which originally a fracture was not suspected but was demonstrated subsequently by routine X-ray examination; also in patients with quickly disappearing symptoms. All such patients recovered their normal neurological status.

Those who showed some abnormality of the normal neurological status showed effects seemingly related to the pathology present in the involved area. Transient symptoms were associated with localized compressions due to bone depression or blood clot, or temporary disturbances in the circulation, especially on the venous side. More lasting or permanent disturbances followed disorganization of brain tissue due to the provocative trauma, changes in the blood supply, division of major nerve trunks, or unrelieved conditions such as depressions, blood clots, etc., which may result in permanent pathologic conditions.

In the absence of any other evidence of a focal lesion, abnormalities of the reflexes had no definite bearing in the total clinical pictures especially from a therapeutic point of view, and under conservative forms of treatment the patients recovered. Bilateral deviation of the eyes was observed in patients with fractures in the parietal portions of the skull. Nystagmus occurred in those who later developed meningitis and those who had a fracture of the mastoid with involvement of the labyrinth. Beginning choked disk is a very important symptom, and eye-ground examinations should be made early.

Conservative and expectant methods of treatment yield the best results but operation is imperative in every case showing the signs of an advancing intracranial pressure and should be done before there is evidence of medullary involvement. Irritative or paralytic focal symptoms pointing to pressure upon or disorganization of definite cortical areas are most important indications for operative interference. For isolated or irregular disturbances of neurological function conservative forms of treatment will yield the best results.

H. A. MCKNIGHT.

Guillain, G.: The Meningeal Hemorrhages Following Non-Penetrating Wounds and Contusions of the Cranium (Les hémorragies méningées consécutives aux plaies non-pénétrantes et aux contusions du crâne). *Arch. méd. belges*, 1919, lxxii, 237.

Guillain gives 13 clinical histories of cases of meningeal hemorrhages following wounds which were observed in the army.

Meningeal hemorrhage following cranial contusions may result in the formation of a subdural hematoma which, according to its situation, may cause blindness, hemianopsia, aphasia, motor deficiency, etc.

Under such circumstances the author believes it an error to open the dura and evacuate the hematoma as the latter may become resorbed either spontaneously or following a simple lumbar puncture. When

the cerebral edema is relieved, normal function is resumed. Exploratory trepanation and opening of the dura are not without danger. Moreover, in cases of meningeal hemorrhage only local anesthesia should be used as the vasodilation caused by general anesthesia may increase the hemorrhage or induce fresh bleeding. The only fatality in the author's cases was probably due to this cause.

Lumbar puncture should never be done in the beginning of a meningeal hemorrhage as the depression due to the withdrawal of the fluid may displace as obstructing clot and thus be the indirect cause of further hemorrhage. When done later, however, it has an evident therapeutic value either because it diminishes the hypertension of the cerebrospinal fluid or evacuates the toxic products of hemolysis.

W. A. BRENNAN.

Barany, R.: Primary Suture of Brain Wounds (Ueber die Primaersutur der Hirnverletzungen). *XII Versamml. d. nord. chirurg. Verein, Kristiania*, 1919, July.

During the war Barany several times reported and recommended the treatment of brain injuries by excision and complete suture of the wound.

The method at first met with considerable opposition, but many of those who at first severely criticized it now strongly advocate it. Barany first recommended this primary excision and suture in gunshot injuries of the brain in 1915 when he lectured at Przemyśl. Since then many articles have appeared in English and French literature by others who adopted the method independently.

W. A. BRENNAN.

Dandy, W. E.: Roentgenography of the Brain after the Injection of Air into the Spinal Canal. *Ann. Surg.*, 1919, lxx, 397.

With the exception of the point at which it is done, the injection of air into the spinal column is very similar to the injection of air into the ventricles of the brain as described in the *Annals of Surgery* for July, 1918, and the *Bulletin of the Johns Hopkins Hospital* for February, 1910.

On introducing air into the ventricles of the brain it was found that some of it passed into the subarachnoid space and was distributed to its various branches, but the amount that passed through and the time of its appearance in the subarachnoid space was capricious. The idea of introducing air into the spinal canal to obtain a complete injection of the subarachnoid was then conceived. It proved to be of very practical value in 8 cases and has been the means of diagnosing a tumor of the mid-brain which had previously escaped localization by all other methods. It has also graphically defined the cause of communicating hydrocephalus. The air injected into the spinal canal passed into the cisternæ where a mechanical block prevented it from reaching the subarachnoid space over the cerebral hemispheres. In another case of hydrocephalus it was possible by this means to determine the patency of the foramen

of Magendie which was obstructed, due to adhesions at the base.

While the procedure has been without deleterious effect, it is attended with risk and is advocated only when it can be applied by a competent surgeon and the patient can be kept under careful observation afterward.

The author regards the method as of the greatest importance in the diagnosis of obscure intracranial lesions. In the roentgenogram the cisterna magna, cisterna pontis, cisterna chiasmatica, and cisterna interpeduncularis can be freely made out. A remarkable feature is the clear picture of the spinal cord surrounded by a column of air. It is anticipated that this may be of use in the diagnosis and localization of spinal-cord lesions.

Maxted, G.: A Case of Malignant Disease of the Pituitary Body, with Comments. *Proc. Roy. Soc. Med.*, Lond., 1919, xii, Sect. Ophth., 42.

The case reported was that of an English soldier, 25 years of age, whose symptoms were epistaxis and diplopia followed by headache mainly over the vertex. Spinal puncture revealed increased intracranial pressure although at no time was there any hyperemia of the disks. In a late stage both disks were atrophic. To the last the central vision was not greatly impaired though the fields showed a bitemporal hemianopia. The diagnosis was not made until six months after the patient entered the hospital and about fifteen months after the first symptoms. The nature of the condition was then discovered only accidentally in an exploratory operation on the sphenoidal sinus. Three months afterward radium was inserted into the sinus but five days later the patient suddenly became delirious, collapsed, and died.

At autopsy a large mass, reported to be a carcinoma which had undergone cystic degeneration, was found compressing the optic chiasm and involving the third and sixth nerves. It had also eroded the bony structure of the sella.

The insertion of radium into the tumor was disastrous as it caused softening and necrosis of the growth, while the resulting hæmorrhage was responsible for a more or less sudden rise of the intracranial pressure which was rapidly fatal. The only sign of interference with the secretions of the pituitary gland were drowsiness, a slow pulse, and a subnormal temperature. T. D. ALLEN.

Adson, A. W.: Cutting the Sensory Root of the Gasserian Ganglion for the Relief of Trifacial Neuralgia. *Surg., Gynec. & Obst.*, 1919, xxix, 334.

The author believes that patients suffering with trifacial neuralgia have a very definite symptomatology and that the treatment should follow one of three courses:

1. An alcohol injection into the peripheral branches. This is indicated only at the onset of the neuralgia in feeble patients who are poor operative risks and in those who are being prepared for the

radical operation. While it is merely a palliative measure, the average time of relief afforded is nine months.

2. Avulsion of the peripheral branches. This may be resorted to in some instances, but is also a palliative procedure, the average time of relief afforded being eight months. It is more difficult to repeat than the alcohol injection.

3. Physiological extirpation of the ganglion or division of the posterior root. While avulsion of the posterior root relieves the pain permanently, it is occasionally attended with two serious complications, i.e., paralysis of the seventh cranial nerve due to trauma at the exit of the root from the pons, and trophic interstitial keratitis due to injury of the inner portion of the gasserian ganglion supplying the ophthalmic branch.

The technique of extirpating the ganglion employed by the author differs from the usual technique in that the dura propria covering the ganglion is not divided except over the posterior root and the ganglion is not exposed during the dissection except at the posterior margin; the posterior root is cut with a guillotine knife on the crest of the petrous bone and a small pledget of muscle is inserted into the dural foramen, the proximal end of the posterior root being pushed back into the posterior fossa. This technique avoids injury to the pons and ganglion, particularly the portion supplying the ophthalmic branch, prevents paralysis of the seventh cranial nerve, and markedly diminishes the frequency of trophic interstitial keratitis.

Bloodgood, J. C.: Scar-Tissue Tumors Occurring on the Mucous Membrane of the Lower Lip. *Surg., Gynec. & Obst.*, 1919, xxix, 340.

Benign scar-tissue tumors of the lower lip are keloid and not unlike ossifying myositis. They follow usually the removal of a small mucous-membrane or subepidermal tumor, appearing as an induration in the scar and manifesting themselves by a sensation of tension, discomfort, and intermittent swelling. Section shows a hypertrophied epidermis, cellular scar tissue, and mucous glands surrounded and invaded by granulation tissue.

These tumors may be mistaken for malignancy, and may be operated upon and re-operated upon only to recur. The treatment is absolute non-interference and the ultimate prognosis complete recovery. In one of the author's cases, however, it was eighteen months before any improvement was noted in the symptoms.

The most common tumor on the mucous membrane of the lower lip is a cyst of the labial glands. Not infrequently these little tumors are removed under a diagnosis of carcinoma. Primary carcinoma of the mucous membrane of the lower lip is rare and usually occurs at the mucocutaneous border. Local recurrence after excision is uncommon.

Following the report of his experience with six cases of scar-tissue tumors which had been repeatedly operated upon, the author emphasizes the im-

portance of subjecting even the most innocent lesion to a microscopic examination and preserving the sections and some of the tissue for future study.

K. L. VEHE.

McGee, R. P.: The Maxillofacial Surgeon in a Mobile Hospital. *J. Am. M. Ass.*, 1919, lxxiii, 1114.

In Mobile Hospital No. 1 many patients were received as early as two hours after the receipt of the injury. Nearly all were suffering from shock and many were in a state of coma. When a fracture of the jaw was followed by shock, the patient recovered from the latter as soon as the jaw was set, due to the fact that it was usually brought about by respiratory obstruction.

The first thing to be done in cases of maxillofacial injuries was to determine the depth and shape of the wound and whether there was loss of tissue. The control of hæmorrhage was not so difficult in these fresh wounds as later in older wounds. Secondary hæmorrhage caused little trouble. When the parotid gland and Stenson's duct were injured, the exposed portion of the duct or gland was picked up with sutures and carried to the inside of the mouth before the face wound was closed. A fistula would then follow the suture line and open into the mouth. Tracheotomy was avoided when possible.

In several cases there were double fractures of the ramus near the condyles which traversed the soft palate. In this type of injury the jaw drops back and downward, interfering with respiration. If the jaw is set with the mouth closed, the swelling of the soft palate will stop respiration completely. It is therefore necessary to splint the mandible with the mouth open and the jaw thrown considerably forward. This was accomplished by means of a splint made with tongue depressors and orthodontic wire. Death follows this type of injury unless treatment is given early. The patients are brought in sitting up, very apprehensive, and experiencing the greatest difficulty in breathing. Those who become unconscious usually die.

In fractures of the maxilla, complete or partial and complicated or not with fracture of the mandible, the best early treatment is the application of the open bite splint, such as that furnished the United States troops, or the Kingsley type used by the New Zealand troops. The author believes the Kingsley type is the best. All chin bandages are very unsatisfactory.

Union usually takes place in fractures of the maxilla much more promptly than in fractures of the mandible. Abscessed teeth or teeth that were actually loosened in the line of fracture were always removed. Incisions were usually unnecessary as the wound of entry and the natural opening of the mouth afforded good access and drainage. In some cases, however, stab wounds under the margin of the mandible were necessary for drainage.

Every fractured jaw should be drained at the point of fracture. The splint made from ortho-



Emergency splint applied, jaw thrown forward and mouth held open.

dontic wire was as a rule easily applied without the use of a general anæsthetic. When an anæsthetic was necessary the splint was not applied until all danger of emesis was passed.

When jaw fractures are complicated by face wounds the fracture should be splinted before the facial wound is repaired. All tissue with sufficient vitality to live should be preserved. As contraction of the muscles of expression draws the lacerated tissues from their natural position, great care must be used in approximating the parts. The mucous membrane should be brought together before the cutaneous surface is sutured. Tension sutures should be used in all extensive injuries.

When the nose is injured it should be repaired at once, and if there is a loss of bone, a modeling compound splint should be used to prevent cicatricial displacement. The mouth should be cleaned hourly with warm salt solution. Five per cent eusol solution is also very effective. As little dressing as possible should be applied to wounds on the surface of the face. In the cases reported wounds of the tongue were numerous but easy to repair. Local anæsthesia induced with procaine was used frequently and with good results. Drainage should be thorough.

I. W. BACH.

Dameron, E. P.: Infected Fractures of the Maxilla. *J. Am. M. Ass.*, 1919, lxxiii, 1273.

The fractures observed ranged from simple fractures to those associated with great loss of bony substance and the enveloping flesh. In some cases bone grafting was necessary. The grafting of bone

too early after the healing of the wound is to be avoided because of the danger from latent infection in closed wounds which, if aroused, may mean the loss of the graft.

A large percentage of the cases presented sinuses, external and internal. These were irrigated with physiological sodium chloride solution or Dakin's solution. Fractures of the maxilla rarely exhibited pus-discharging sinuses but in those of the mandible the infection was greater. When anatomically possible it is best to remove the infection by surgical operation.

Loose bone should not be removed from the site of the fracture if there is the slightest attachment to the tissues as it may act as a matrix for new bone formation even though some of it may be thrown off later. Disease of the bone above the mylohyoid ridge finds expression in the oral cavity and below the ridge in the soft tissues and glands of the neck. As a rule, when foreign bodies, bone sequestra, etc., are removed, quick union results.

Wiring the necks of teeth and tying the ends of these wires to those of others attached to opposing teeth should be done only as a temporary measure. Loose teeth should be removed as the pulp dies. Removal of loose teeth in or adjacent to the line of fracture results in rapid union.

Roentgenograms are insufficient to determine the true condition, drilling of the teeth being often necessary. Bone sequestra usually exfoliate; teeth rarely do. The article contains 7 brief case reports.

C. R. STEINKE.

Hoshino, T.: An Operation for the Preservation of the Mucoperiosteum in Resection of a Portion of the Maxilla. *Ann. Otol., Rhinol. & Laryngol.*, 1919, xxviii, 479.

The technique used by the author to prevent a communication between the mouth and nasal cavity following resection of the palatal portions of the maxilla was as follows:

The operation was performed under local anæsthesia and with the patient in the sitting position. The left external carotid artery having been ligated, a transverse incision was made across the alveolar process of the maxilla down to the bone and the periosteum elevated to expose the field of operation. Since the nasal cavity was not invaded by the tumor, the periosteum was merely lifted from the floor and lateral wall of the left nasal cavity with a periosteal elevator. The instrument was placed beneath the mucoperiosteum at the edge of the apertura nasi. The tumor was then chiseled away from the healthy bone, only the mucoperiosteum from the floor and lateral wall of the nasal cavity being left. It was necessary also to remove the anterior part of the alveolar process from the incisor tooth on the right side to the first molar tooth on the left side, the anterior half of the hard palate, and one-third of the median wall of the antrum of Highmore. The mucosa of the sinus, however, was not disturbed.

The next step consisted in loosening the mucous membrane on the remaining portion of the hard palate and the upper lip, and approximating them to the edges of the wound. There then remained only a small wound in the roof of the mouth to heal by granulation from the surrounding edges of the mucosa and the nasal cavity was covered entirely by the mucoperiosteum.

The patient recovered in sixteen days without any complication. When the wound had healed the roof of the mouth and the nasal cavity were separated by mucous membrane and intervening soft tissues. The patient is now able to talk and food does not pass into the nares. O. M. ROTT.

Powers, C. A.: Phases of War Surgery—Bone Transplants from the Tibia to the Lower Jaw for Loss of Substance. *Ann. Surg.*, 1919, lxx, 476.

Powers performed 11 transplantations of bone from the tibia to the lower jaw at the American Hospital at Neuilly, France. Of these 11 operations, 8 (73 per cent) were fully successful, and 3 (27 per cent) complete failures. In 1 (9 per cent) the final result was undetermined, but probably a success. On dividing these 11 cases into classes by years, it was found that in the 5 operated upon in 1916 the results were successful in 2 (40 per cent) and unsuccessful in 3 (60 per cent), while in the 6 cases operated upon in 1917 after wider experience the outcome was fully successful (solid bony union, good mastication, excellent approximation of the dental arcades) in 5 (83 per cent), and undetermined but probably successful in 1 (17 per cent).

The operation is difficult because of the proximity of the operative field to the mouth and nose. The slightest infection is practically always fatal to success.

Tainter, F. J.: Ununited Fractures of the Mandible Treated by Bone Graft. Preliminary Report. *J. Am. M. Ass.*, 1919, lxxiii, 1271.

In this type of fracture non-touch or "knife and fork" surgery is most carefully carried out. A description of the Cole pedicled bone graft technique is given as follows:

A piece of the mandible about $\frac{1}{4}$ inch wide is removed with the electric saw, leaving attached muscle and facial tissue which includes the platysma myoides and usually most or all of one or two of the anterior bellies of the digastric muscle. This graft is then shifted across the gap and wired firmly to the anterior and posterior fragments. The article contains illustrations of the operation.

The standardized splint was termed by Bubb a "modified detachable Gunning." In all of the cases reported the open bite splint was used. Plastic operations on the mouth should always be performed in the open bite. Invariably all plastic reparation was done first.

When it was deemed necessary to thicken the walls so as to make a proper bed for the graft, decalcified bone was introduced beneath the skin

after it had been undermined. In edentulous cases a circumferential wire was placed around the body or ramus of the mandible and fastened to the splint. Intratracheal anæsthesia was always preferred. The marked and uniform difference between a free and a pedicled graft proved that the pedicled graft is superior because it remains alive throughout the process of repair and does not absorb.

C. R. STEINKE.

Morestin, H.: The Radical Cure of Cancer of the Tongue (La cure radicale de cancer de la langue). *J. de chir., Par.*, 1919, xv, 221.

From the clinical and operative examination of patients and the findings obtained by autopsy it is evident that tongue cancer does not become generalized, the cases being few in which true metastases have been found. The growth may invade the cervical glands but does not progress beyond them.

In order to destroy lingual cancer the mere excision of a margin around the visible lesion, however, does not suffice; one-half of the organ must be sacrificed when the neoplasm is as yet little extended; all the horizontal portion of the tongue when the lesion is situated at the tip; and the entire tongue for a cancer straddled on both halves. Moreover, the mucosa between the tongue and the gums and even the subjacent alveolar part of the jaw must be destroyed if there is the least sign of extension around the tongue. The lateral half of the tongue should be removed from the level of the hyoid bone below up to the pharyngeal wall.

Therefore, in cases of common unilateral cancer of the tongue situated at about the site of the molars the minimum ablation should be: the corresponding half of the tongue, the neighboring floor mucosa, the pre- and subamygdaloid mucosa, the anterior subhyoid and submaxillary glands, and the anterior and posterior carotid glands in the sternomastoid region. It would be more prudent still to add to this the removal of the glands on the opposite side.

Morestin describes his operative technique for dealing with the common type of unilateral cancer in great detail, the text being well illustrated with 14 clear schematic drawings. As a route of access he uses a three-branched cervical incision. All methods of endobuccal removal of a lingual cancer are inadequate, the cervical route being the only one that permits a methodical operation.

After the flaps formed by the incision are turned back, the technique includes the dissection of the sternomastoid muscle, the freeing of the spinal nerve, the dissection of the internal jugular vein, section and ligation of the upper thyroid vein, and the exposure of the neighboring carotid arteries, veins, and glands. The technique leads finally to the removal *en bloc* of the cancerous half of the tongue and the submaxillary and contiguous glands.

As regards results, Morestin states that while there are some recurrences, many cases remain free from recurrence after periods varying from one to ten years.

After removal of half or all of the tongue, speech difficulties are not so serious as might be expected; the principal difficulty is experienced in mastication.

W. A. BRENNAN.

Sebileau, P.: Operative Treatment of Fistulæ of Stenson's Duct (Traitement opératoire des fistules du canal de Sténon). *Bull. et mém. Soc. de chir. de Par.*, 1919, xlv, 1220.

In the course of his war experience Sebileau observed twelve cases of fistula of Stenson's duct. He operated upon and cured all but one.

As they come to the surgeon these fistulæ may be divided into three classes. In the first, the two ends of the duct can be found on dissection and reunited. In the second, the two ends of the duct can be found but cannot be reunited. In the third, the upper end of the duct can be found but not the lower end.

For each of these varieties Sebileau has devised a special technique, but the principle underlying all is the same, viz., drainage of the saliva issuing from the upper end of the duct toward the mouth along threads in the cheek. The orifice is first opened up and the upper end of the duct is found. A few silk or linen threads are then passed through the parotid end of the duct. Each thread forms a loop the free ends of which are not knotted but are gathered and passed through the eye of a stylet. If the lower end of the duct is found, the stylet with the threads is passed through it and the two portions of the duct are approximated if possible; if not possible, the threads are left between the ends. If the lower end of the duct is not found a small opening is made in the mucosa of the cheek in about the position normally occupied by the orifice of the duct and the stylet with the threads is drawn through it. In any case the threads are drawn through the mouth by the labial commissura and fixed to the cheek with a strip of adhesive plaster. All fibrous tissue in the vicinity of Stenson's duct is resected and the wound in the cheek is sutured. Ordinarily there is some slight inflammatory reaction, but at the end of two or three weeks the fistula is cured. Sebileau cannot explain the mechanism by which this result is obtained.

W. A. BRENNAN.

Lankford, A.: The Principles Involved in Interchangeable Interdental Splints with Attachment for Extrafacial Tension in Maxillofacial Surgery. *Dental Cosmos*, 1919, lxi, 839.

The purposes for which interchangeable interdental splints are used are as follows:

1. Prevention of contraction and distortion of used parts.

2. Relief of tension from sutures after plastic operations. They are applicable especially in restoration of the chin, lip, nose, and cheek.

3. Relief of tension due to pressure on the supra-orbital ridge in the pedicles of flaps turned down from the forehead. They thus prevent obstruction to vascularity with sloughing and loss of the flap.

4. To lead bone fragments of the mandible into new anterior positions.

To sum up, this type of appliance may be applied where and whenever extrafacial pull or tension will facilitate the operation desired.

M. N. FEDERSPIEL.

NECK

Loeb, L., and Hesselberg, C.: Studies on Compensatory Hypertrophy of the Thyroid Gland. II. (a.) Hypertrophy in Autotransplants of the Thyroid Gland; (b.) Does a Deficiency in Organ Function Influence the Transplantability? (c.) Hypertrophy in Multiple Transplants of the Thyroid Gland. *J. Med. Research*, 1919, xl, 265.

After autotransplantation of one lobe of the thyroid, mitoses appeared mainly in the first two weeks following transplantation; some of these mitoses were of a regenerative character while others were indicative of beginning hypertrophy. After autotransplantation with almost complete extirpation of both lobes, mitoses seemed to be more frequent in the early stages of hypertrophy, at the time when hypertrophy was being established.

In remnants as well as in autotransplants three periods differing in the character of proliferation activity were distinguished: the period of regenerative proliferation, the period of proliferation due to early hypertrophy, and the resting period.

The frequency of hypertrophy in autotransplants and in remnants was similar. The earliest period at which hypertrophy was found was eight days and eighteen hours after operation, when it was observed in a transplant. The character and degree of hypertrophy were almost identical in the autotransplants and remnants.

In the autotransplants the appearance of phagocytic cells in the colloid of acini and the coalescence of neighboring acini were more frequent than in remnants.

There was no relation between the ages of the animals and their liability to acquire compensatory hypertrophy of the thyroid gland within the range observed. In pregnant guinea pigs the hypertrophy was very weak.

Autotransplants of thyroid tissue differed from homotransplants in the structure of the central zone. In homotransplants the central zone consisted merely of fibrous tissue which was poorly vascularized, while in autotransplants the central zone was made up of a peripheral layer of myxoid tissue relatively well supplied with lymph and blood vessels and a central fibrous nucleus. The autotransplants differing in metabolism from the homotransplants had a stimulating effect on the formation of blood and lymph vessels which was considerably greater than that of the homotransplants. This difference in the effect of auto- and homotransplants was independent of their influence on the lymphocytes. The increased vascularization in autotransplants led to the formation of myxoid

connective tissue. Blood and lymph vessels accompanied by fibroblasts secondarily penetrated into the central fibrous tissue and brought about its gradual absorption. Local infection as well as general sickness of the animal interfere with the organizing activity of fibroblasts, and particularly with the vascularization of the area to be organized.

A deficiency in functional (metabolic) activity of thyroid tissue did not noticeably influence the processes in organization and vascularization which determine the healing-in and preservation of the graft.

In cases of multiple transplantation the transplanted lobes of thyroid had the same fate as the corresponding tissue in cases of single transplantation under otherwise similar conditions.

The success of the transplantation did not depend upon supplying a physiological need of the organism. In cases in which a physiological need had been created, as evidenced by the development of compensatory hypertrophy, the fate of the graft was the same as in other cases in which such a need did not exist.

G. E. BEILBY.

Thomson, S. C.: Tranquil Tracheotomy by Injecting Cocaine within the Windpipe. *J. Am. M. Ass.*, 1919, lxxiii, 1032.

Thomson performs a tranquil tracheotomy, i. e., a tracheotomy without pain, spasm, or coughing, by injecting cocaine within the windpipe in the following manner:

"An ordinary hypodermic syringe is charged with about 20 drops of a 2.5 per cent solution of cocaine. As soon as ever the tracheal rings are laid bare the syringe is grasped, as one does a pen, with the forefinger about 1 inch from the extremity of the needle, and with this the windpipe is sharply stabbed between two rings. The middle, the ring, and the little finger of the operator's right hand are resting on the neck, and they prevent the point from penetrating more than $\frac{1}{4}$ to $\frac{1}{2}$ inch within the lumen of the trachea. The cocaine solution is injected into the cavity of the windpipe, from 5 to 15 drops, and the needle is sharply withdrawn.

"The liquid in the windpipe at once gives rise to a slight, stuffy cough. It causes no spasm or distress, and as it trickles down toward the region which endoscopists know to be the sensitive spot of this area, namely, the carina at the bifurcation of the trachea, this tickling cough soon ceases. If there is no great urgency, ten minutes should be allowed to elapse, the time being occupied by clearing the front of the trachea, checking all bleeding, preparing the tube, and so forth. At the end of that time the incision can be made into the trachea and the cannula introduced without pain, spasm, or even the slightest cough, as quietly and smoothly as the original incision through the skin. The calm with which this proceeding takes place is in striking contrast with the agitated, hurried, and often bloody and dangerous operation of former days.

"In children a 1 per cent solution and 5 drops would be sufficient."

O. M. ROTT.

SURGERY OF THE CHEST

TRACHEA AND LUNGS

Bull, P.: Further Experiences with Extrapleural Thoracoplasty in Pulmonary Tuberculosis (Weitere Erfahrungen ueber die extrapleurale Thorakoplastik bei Lungentuberkulose). *XII Versamml. d. nord. chirurg. Verein*, Kristiania, 1919, July.

In 1916 Bull reported a series of 11 cases of unilateral pulmonary tuberculosis which were treated by resection of the ninth and tenth ribs. Since then, 26 new cases have been operated upon in this manner. In the first series there were 3 deaths, and in the second series, 1 death. The considerable improvement in the second series is to be ascribed particularly to the fact that in these cases the operation was performed in 2 stages.

The first stage of this operation is always done under local anæsthesia, and the second often under general anæsthesia, especially in cases in which there are no cavities. As a rule the first rib is resected. In cases of bulging cavities Bull recommends the removal of from 120 to 130 centimeters or perhaps more.

Cases in which a cavity in the lung apex does not collapse after the second treatment are treated by intrathoracic fat transplantation. A long incision having been made in the axilla, sloping forward and downward, from 6 to 8 centimeters of the third and fourth ribs are resected, and extrapleural apicolysis of the lung is done. The fat flap, about the size of the palm of the hand or the whole hand, is obtained from the abdomen where the subcutaneous fat is especially soft and pliable. After this flap is placed in position the wound in the axilla is sutured in three layers without drainage.

Of the 37 patients operated upon by the author 4 died following the operation; 8 died later, 7 from tuberculosis and 1 from influenza; 7 are still alive with symptoms of tuberculosis; and 7 were operated upon such a short time ago (less than a year) that the final results cannot be stated. Of 11 who may be considered cured, 2 have remained cured for five years and 1 for three years. In 4 of these cases the first rib was removed, in 6 the second, and in 1 the third rib. W. A. BRENNAN.

PHARYNX AND ŒSOPHAGUS

Moore, I.: Foreign Bodies in the Œsophagus and Respiratory Passages; Remarks on the Dangers Arising from Their Impaction and Some Difficulties Which May Be Met With in Their Removal; A Plea for the Abolition of the Coin-Catcher, the Blind Use of the Bougie and Probang, and Their Replacement by the Direct Endoscopic Methods of Extraction. *Lancet*, 1919, cxcvii, 566, 609.

In a very comprehensive, well-illustrated article Moore points out the dangers incident to blind instrumentation in attempting the removal of

foreign bodies from the œsophagus and respiratory passages. Several cases are cited showing disastrous results following the use of such instruments as the coin-catcher, bougie, and probang. A strong plea is made for the use of direct endoscopic methods in removing such foreign bodies. It is shown that the mortality in these cases has been greatly reduced by the use of the direct method of removal.

The author calls attention to the fact that the X-ray should be considered only as an accessory in endoscopic work and is not an absolute necessity. Many foreign bodies, such as buttons made of vegetable ivory and some forms of vulcanite, may not be revealed by the X-rays.

The danger from perforation of foreign bodies from the œsophagus into the aorta is emphasized and several cases are cited. While it is not known definitely why smooth objects in some instances cause ulceration and perforation and in others remain harmless and symptomless, a septic condition of the foreign body, alteration in the secretions, and the chemical composition of the substance impacted may be the determining factors. The removal of foreign bodies should not be delayed. Owing to the fact that bougies, etc., are not so frequently used in attempting the blind removal of foreign bodies from the respiratory passages, the prognosis in such cases is much better than in cases of foreign bodies in the œsophagus.

A series of 37 cases of coins in the air passages is reported. Twenty-two were impacted in the larynx, 3 were in the trachea, and 12 in a bronchus. Seventeen were coughed up (8 assisted by inversion), and 2 were coughed into the mouth, swallowed, and later passed per anum. Thyrofixure was performed in 1, laryngotomy in 2, laryngotracheotomy in 3. Laryngeal forceps were used in 6 cases. In 3 cases the coin was removed by peroral endoscopy, and in 2 instances no attempt at removal was made.

Four of the patients died, 3 from pulmonary tuberculosis several years after impaction of the coin, and 1 from apoplexy following tracheotomy. No deaths followed inversion.

No statement is made concerning local anæsthesia in peroral endoscopy, but chloroform is recommended when a general anæsthetic is required.

In conclusion the author again urges early removal of foreign bodies in the œsophagus and respiratory passages by direct endoscopy and states that the patient is not free from danger until such removal is effected. P. P. VINSON.

MISCELLANEOUS

Strauss, S. G.: Malignant Neoplasms of the Thymus Gland. *N. York M. J.*, 1919, cx, 646.

The author reports a case of mediastinal malignancy of thymic origin. Postmortem examination

showed an irregular mass about 5 centimeters square in the superior mediastinum which had completely obliterated the superior vena cava and invaded the inter-auricular septum.

After a review of the literature and a discussion of the origin of the thymus gland and of the pathology and classification of tumors of thymic origin, the author draws the following conclusions:

1. The thymus is entirely an entodermal epithelial structure.

2. Remnants surely persist to the age of 40 years and probably longer.

3. Malignant neoplasms arising from the gland may be divided into sarcomata and carcinomata, but only if one adheres to the morphological classification.

4. The diagnosis of thymic origin may be made in spite of the absence of the Hassall corpuscles.

5. In the presence of mediastinal new growths, the possibility of thymic origin must be considered even the cases of old persons.

6. Sarcoma is more frequent than carcinoma in the young, and carcinoma more frequent than sarcoma in the old.

K. L. VEHE.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Hughes, B.: *Acute Diffuse Peritonitis. A Series of Twenty-One Consecutive Cases.* *Brit. M. J.*, 1919, ii, 373.

The anatomy of the peritoneum is briefly reviewed and the absorption powers of the peritoneum are discussed. Peritonitis may be caused either by trauma or disease. Once infected, the peritoneum becomes hyperæmic and pours forth an exudate into the subperitoneal tissues around the infected focus. This is followed by the exudation of a purulent fluid into the neighboring peritoneal cavity. On microscopic examination this fluid will be found to contain endothelial cells and a few polymorphonuclear leucocytes but no bacteria. Cultures may show staphylococci but these probably come from the skin. At this time adhesions are being formed and there is an arrest of peristalsis. If the inflammatory focus is not localized, the infection will be disseminated throughout the peritoneal cavity. Peristalsis is the chief factor in the dissemination and is often stimulated by the administration of an aperient. The fluid exudate first formed is later converted into pus which is enhanced by the increasing intra-abdominal tension brought about by the distension of the intestines. Plastic adhesions are a good sign and indicative of a high degree of resistance. If pus is formed, septic absorption takes place and toxæmia results.

Abdominal rigidity, pain, and tenderness are among the first symptoms of peritonitis. A mass may be found later. As the condition progresses, there is generalized abdominal tenderness and rigidity, and distension and vomiting begin. Constipation is absolute and the urine is diminished. Hiccough may occur. The tongue becomes dry and coated and the lips and teeth are covered with sordes. The vomiting may be of two types: (1) biliary—nature's attempt at excretion; and (2) coffee-ground in character—a sign of severe toxæmia.

The only complication to be feared apart from toxæmia and localized abscesses is intestinal obstruction.

In regard to the treatment the author states that all are agreed that the cause should be removed at the earliest possible moment. If the case is in the early stages and the protective fluid is of first rate vitality, it is sufficient to mop out carefully any obvious pouches in the region of the area of operation with dry sterile swabs and abandon all forms of drainage. If the fluid is frankly purulent, drainage should be established by means of small tubes or a glove drain which reaches to the primary focus of infection. The drain should be removed at the end of forty-eight hours. It is unwise to disturb any lymph that may be deposited upon the ducts or to attempt to unravel coils of matted intestine. To overcome the distention the author advocates rest.

The only method of splinting an inflamed bowel is by administering morphine and atropine. Morphine, $\frac{1}{4}$ gr., should be given every eight hours, and atropine, $\frac{1}{100}$ gr., every twelve hours. When the pupil becomes constricted the morphine should be given at twelve-hour intervals. These drugs are administered until flatus is passed and the vomiting ceases, which invariably occurs at the end of the fourth or fifth day. In the author's opinion the vomiting should be encouraged. As continuous vomiting rapidly dehydrates the patient, however, from 9 to 10 pints of normal saline solution should be given by hypodermoclysis in twenty-four hours. Continuous saline by rectum may also be prescribed. Copious drinks of water containing sodium bicarbonate and sodium citrate are given by mouth. Bismuth and compound tincture of camphor are beneficial as soon as the vomiting has ceased. No nourishment should be permitted for the first forty-eight hours. On the third or fourth day glucose may be given by rectum.

As soon as the vomiting has ceased Brand's essence and albumin water sweetened with glucose should be prescribed. At the end of a week milk and soda water, raw eggs, and a little custard are permissible. On the tenth or twelfth day castor oil may be given, and after this all anxiety is practically at an end.

The cause of the condition in the author's cases was abscess of the appendix in 6, perforated gastric ulcer in 1, penetrating wounds of the abdomen in 8, intestinal obstruction with gangrene of the bowel in 3, intestinal obstruction with perforation of the bowel in 1, and pneumococcal infection in 2. There was 1 death, that of a patient with intestinal obstruction and gangrene.

J. A. H. MAGOUN, JR.

GASTRO-INTESTINAL TRACT

Pauchet, V.: The Surgical Treatment of Stomach Diseases (*Traitement chirurgical des affections de l'estomac*). Paris: Maloine, 1919.

Of every 10 patients complaining of chronic gastric trouble, 9 have reflex dyspepsia without a gastric lesion. These 9 patients have: (1) some surgical abdominal affection (such as appendicitis, ileal stasis, pancreatitis, gall-bladder disease, adnexal disease, etc.); (2) nerve trouble (such as tabes, neurasthenia, etc.); or (3) a general disease (such as pulmonary tuberculosis, chronic lead poisoning, hepatic insufficiency, heart disease, kidney disease, etc.)

Whenever a stomach lesion is present it is always an ulcer or a cancer. Duodenal ulcer is more frequent than gastric ulcer and does not degenerate into cancer. Seventy-five per cent of gastric cancers are old ulcers. The classical symptoms of peptic ulcer (vomiting, pain, and hæmorrhage) are often absent, and only the signs of dyspeptic hyperacidity are observed, i.e.: (1) chronic hyperacidity; (2) relief from bismuth, alkalies, and food; and (3) intermittency of the crises.

Every gastric or duodenal ulcer should first be treated conservatively, viz., by rest in bed for four or five weeks and fasting followed by slow resumption of food. Even if the symptoms of ulcer disappear it cannot be said that the condition is cured because intermittency of the crises with intervals of apparent health is the rule even when the ulcer is active.

A duodenal ulcer is almost always situated in the first part of the duodenum; a gastric ulcer, on the lesser curvature. An ulcer on the pylorus or the anterior or posterior wall of the stomach is usually an extension of an ulcer situated on the lesser curvature.

SURGICAL TREATMENT

Duodenal ulcer: Removal of the ulcer or pyloro-duodenal exclusion are the operations of choice, but give a mortality of 5 per cent. The mortality of simple gastro-enterostomy is nil and definite recovery follows this operation in 75 per cent of cases of duodenal ulcer. If the patient experiences a renewal of the trouble, the pyloroduodenal ring should be resected.

In 4 or 5 per cent of the cases it is necessary to operate also for an associated cholelithiasis, uronephrosis, appendicitis, or a Lane's kink.

Gastric ulcer: A small and recent gastric ulcer may be treated by Balfour's method (thermocautery destruction). An old callous ulcer, especially if it has perforated and there is perigastritis, should be extensively resected. Wide gastro-pylorectomy is preferable to simple excision of the ulcer as it gives more certain recovery. The second portion of the duodenum and then the stomach immediately above the ulcerous lesion having been sectioned, a gastro-jejunosomy is done. The mucosa should be sutured with No. 00 chromic catgut.

Cancer: Cancer should be treated by wide gastrectomy—section of the duodenum as far as the pancreas and of the stomach as high as possible. All the glands should be removed. The author emphasizes the importance of stripping the glands of the lesser curvature without removing all the gastric wall of the lesser curvature. This is accomplished by subserous denudation. After resection a gastro-jejunal implantation is done.

Hour-glass stomach: The author does not use such procedures as gastro-gastrotomies, gastro-enterostomies, etc., as ulcers develop at the site of the sutures. He recommends extensive gastropylor-ectomy followed by the formation of an anastomosis between the upper sac and the jejunum.

Gastrocoloptosis: The results of gastropexy are very good in about one-third of the cases. Failures are due to the fact that the gastrocoloptosis is often accompanied by general ptosis and Lane's kinks. Therefore in some instances an ileosigmoidostomy, a colectomy, a nephropexy, or a hepatopexy is required in addition to gastropexy.

Anæsthesia: The author performed all operations under local anæsthesia induced by the direct injection of the Corbière adrenalized cocaine into the solar plexus, the intercostal nerves, or the spinal canal, and in some instances supplemented by whiffs of nitrous oxide or ethyl chloride. He never employs general anæsthesia in these cases as it predisposes to pulmonary complications.

W. A. BRENNAN.

Tenani, O.: A Variation of Pyloric Resection (*Sopra una variante di resezione pilorica*). *Polidlin.*, Roma, 1919, xxvi, sez. chir., 185.

The author states that all methods of pyloric resection in present use are defective to a greater or less extent as they do not effect a perfect and stable closure of the duodenal orifice, bile and pancreatic secretion are retained in the duodenum, and the physiological rhythm of the biliary and pancreatic secretions is disturbed.

The author's method of resecting the pylorus, which was first tried experimentally on the cadaver and later used successfully in two cases of pyloric cancer, is divided into three stages. In the first stage he performs a von Hacker transmesocolic posterior gastro-enterostomy. The second stage consists of a pylorotomy and the closure of the gastric orifice alone. In the third stage, the first part of the duodenum is mobilized and an end-to-side anastomosis

is made between it and the jejunal loop at a short distance from the gastro-enterostomy.

The mobilization of the duodenum is effected by entirely freeing it from the parietal peritoneum or, more exactly, the duodenorenal peritoneum. To do so the peritoneum is incised between the duodenum and the kidney for the whole length of the second portion of the duodenum which is displaced toward the center. To the right the trunk of the vena cava, the medial portion of the anterior surface of the right kidney, the renal vessels, the kidney pelvis, and the upper part of the ureter are then seen. The gastrohepatic omentum should also be incised as this makes it possible to push the duodenal stump down. By displacing the duodenum toward the median line, the organ is not only mobilized but is moved from the dangerous vicinity of the vena cava. The head of the pancreas being in intimate contact with the duodenum, the pancreas is medially displaced with the latter and the common duct.

To accentuate the depressed position of the duodenal stump and facilitate the drainage of the biliary and pancreatic secretions, a tract of the duodenal wall above the outlet of the common duct is fixed by a few sutures to the stomach so as to form a bend in the duodenum. At this point the duodenal stump is brought into contact with the jejunal loop and if the end-to-side anastomosis is made with sutures in two planes the approximation will be exact.

The author considers the advantages of this method to be: (1) the elimination of the danger of perforation of the duodenal stump, and (2) the re-establishment of the biliary and pancreatic secretions according to normal physiology.

Through the duodenojejunal anastomosis the direct discharge of the bile and pancreatic juice synchronous with the passage of the gastric chyme is obtained, just as in normal conditions, and the secretory products do not remain in the duodenum as is the case following the use of the Billroth II method.

W. A. BRENNAN.

Krogius, A.: The Surgical Treatment of Gastric and Duodenal Ulcer (Die chirurgische Behandlung von *Ulcus ventriculi et duodeni*). *XII Versamml. d. nord. chirurg. Verein*, Kristiania, 1919, July.

Krogius gives the results of the study of 391 patients who were operated upon by him for gastric or duodenal ulcer from 1901 to 1916. Of these, 337 were men and 54 women, a ratio which strikingly contradicts the general supposition that gastric ulcer is twice as frequent among women as among men.

Regarding the age incidence, the author states that most of the patients were between 36 and 40 years of age at the time of admission to the hospital and that in most instances the symptoms first appeared between the ages of 21 and 25 years. In only 25 (6 per cent) did the disease begin before the fifteenth year, and in 34 (9 per cent) after the fifth year.

In the majority of cases the site of the ulcer was

in the pyloric part of the stomach and in the upper portion of the duodenum. Ninety-five per cent of all the stomach ulcers were situated on the lesser curvature.

Hæmorrhage occurred in 40 per cent of the cases, this percentage not including occult hæmorrhages. Chemical examination of the stomach contents showed hyperacidity in 40 per cent of the cases, normal acidity in 30 per cent, and subnormal acidity in 30 per cent. In the cases of duodenal ulcer, however, hyperacidity was found in 60 per cent. In 30 per cent no acidity was detected.

Hunger pains are not pathognomonic of duodenal ulcer, constituting only a part of the syndrome described by Soupault and Hartman in 1899 as the pyloric syndrome. This syndrome is found in all cases of juxta-pyloric ulcers, whether or not they are situated in the pylorus itself or on the duodenal or gastric side of it. Clinically it is difficult to differentiate between ulcers in the duodenum and the pyloric portion of the stomach. Hunger pains occur also in cases of ulcer not situated within the pyloric area.

From the viewpoint of the differential diagnosis it may be mentioned that long duration of the condition is not characteristic of ulcer. According to several authors, this is common also to cancer since in certain cases cancer develops following chronic gastritis. The danger of cancer in cases of ulcer has evidently been exaggerated. Carcinoma is found only in small groups of cases treated by resection and the resection was done because cancer was suspected.

From 1907 to 1918, 129 cases of perforating ulcer were treated by excision and suture in the surgical hospital of Helsingfors. In 3 cases in which suture was impossible a drain was inserted through the ulcer into the duodenum, and through this tube the patient was fed. Krogius formerly preferred the Mikulicz tampons, but recently he has used Dreesemann's glass drain. In 30 cases a primary gastro-enterostomy was done.

W. A. BRENNAN.

Nielson, A.: Carcinoma Following Gastric Ulcer (Ueber Carcinoma ex ulcere ventriculi). *XII Versamml. d. nord. chirurg. Verein*, Kristiania, 1919, July.

In the Royal Danish Hospital Nielson has traced 221 cured cases of clinically established gastric ulcer for periods ranging from two and one-half to twenty years. In 155 of these, in which there were 23 deaths and the symptoms had been noted from six to fifty-seven years before treatment, there was no demonstration of any tendency to cancer.

Of 66 cases in which there were 19 deaths and the symptoms had been noted for less than six years before treatment, gastric cancer was demonstrated in 10. It is such cases as these 10, which exhibited first the typical clinical picture of ulcer and a few years later proved to be gastric cancer, that are

responsible for the theory that cancer develops from ulcer. In the author's opinion, however, it is more probable that the primary condition was a carcinoma simulating ulcer. In the majority of articles dealing with ulcer-cancer it is stated that the ulcer symptoms developed after the thirtieth year of age and the condition proved to be cancer a few years subsequently. The transition of ulcer to cancer has never been proved, however, and if it does occur, is certainly so rare that it is of little importance as regards the treatment of simple ulcer. The problem is rather to determine how a carcinoma simulating ulcer can be distinguished from a simple ulcer.

When a patient begins to show the symptoms of ulcer after his thirtieth year of age and in the course of from six months to three years develops the typical picture of juxtapyloric ulcer, the author believes the probability that the condition is cancer is sufficiently great to render the removal of the ulcer advisable.

W. A. BRENNAN.

Borelius: The Results of Operations for Cancer of the Stomach and Cancer of the Breast (Ergebnisse von Operationen wegen Cancer ventriculi und Cancer mammae). *XII Versamml. d. nord. chirurg. Verein*, Kristiania, 1919, July.

The author's statistics are based on cases of gastric and mammary cancer treated in the University Surgical Hospital of Lund. From July 1, 1898, to January 1, 1919, 657 cases were admitted, and of these 501 were operated upon. The results in these 501 cases are summarized in the following table:

Operation	Total	Percentage of operations Percent.	Cured	Deaths following operation	Operative mortality Percent.
Exploratory laparotomy.....	125	25	104	21	16.8
Gastro-enterostomy	229	45.7	191	38	16.6
Resection.....	147	29.3	116	21	21.1
Total	501		411	90	18

The results of the resections are summarized as follows:

Resection	Total	Deaths	Operative mortality Per cent.
Kocher.....	75	10	13.3
Billroth II.....	67	18	26.9
Polya-Mayo.....	3	2	
Sector.....	1	0	
Transverse.....	1	1	
Total	147	31	

Of the 116 patients who survived resection, 8 were operated upon in 1918 and 2 cannot be traced. Of the other 106, 85 died from recurrence after recovery from the operation, 4 died from intercurrent disease, and 17 still remain cured. One remains cured after sixteen years, 1 after thirteen years, 1 after eight years, 3 after from six to seven years, 1 after five years, 4 after from three to four

years, 3 after from two to three years, and 3 after from one to one and a half years. Of those who died from some other condition 2 remained free from recurrence for more than three years after operation. Of those who died from recurrence, 10 lived for more than three years after operation. The total number living more than three years after operation is 21. Therefore there was a definite recovery in 21.7 per cent after the resection operation.

When indicated, Borelius performs a resection whenever it is technically possible as he believes it is a better palliative operation than gastro-enterostomy. Unfortunately, however, it is not possible in more than one-fourth of the cases.

The report of the results of the operative treatment of cancer of the breast are based on the statistics of 350 cases operated upon during the period from July 1, 1898, to December 31, 1912. In spite of the extensive operation, which included the clearing out of the axillary cavity and the removal of the pectoral muscles, there were only 2 deaths. In the 275 cases which were traced subsequently, a recurrence was reported in 185. In 7 cases there was a late recurrence from three and one-half to ten years after operation.

Since 1906 operation has been supplemented by systematic roentgen treatment in the hope that by this means better permanent results will be obtained.

W. A. BRENNAN.

Nitch, C. A. R., and Shattock, S. G.: Diffuse Emphysema of the Intestinal Wall (Two Cases), with Remarks upon Pneumatoses. *Proc. Roy. Soc. Med.*, Lond., 1919, xii, Sect. Path., 46.

The condition described may be excluded as a postmortem event since in both of the reported cases the lesion was found at the time of operation which in one instance was performed for pyloric stenosis and in the other for what was diagnosed as intussusception.

In the first case, the small intestine was studded with grayish-white elevations which proved to be multilocular subperitoneal cysts and on puncture were discovered to contain air instead of fluid. More of them were rather evenly dotted over the circumference of the small bowel and a few were found also in the transverse mesocolon and at the base of several appendices epiploicæ. With the exception of the first 12 inches of the jejunum and the last 12 inches of the ileum, the whole length of the small bowel was involved. The mesentery of the small bowel and the walls of the stomach, duodenum, and colon, however, were normal. For the purpose of investigation a small V-shaped piece of intestine was excised. Its mucous membrane was raised in rounded confluent elevations which were obviously filled with gas. On the peritoneal side at this particular point the intestine was normal. Histologically, the walls of the spaces (which were limited to the submucosa) consisted of ordinary connective tissue in which there was no infiltration or sign of inflammation.

The results of experimental study seem to indicate that the condition is the result of an effusion of gas from the lumen of the alimentary canal through a rupture or an ulcer of the mucosa. The most probable explanation in the first of the authors' cases was that, due to the forcible displacement of air and gas from the dilated stomach, presumably through an ulcer which lay immediately behind the pylorus, the gas passed first into the submucosa and thence through the muscular wall into the subperitoneal tissue, its wide extent along the bowel being due to peristalsis.

The second case presented histologically the picture of an acute infective process and the authors attribute the emphysema to an infection of the wall of the cæcum by a gas-producing bacillus.

The lesions described fall into the comprehensive group of pneumatoses which may be subdivided as to their etiology into: (1) bacterial pneumatoses due to the bacillus aerogenes, bacillus oedematis maligni, or bacillus coli; and (2) pneumatoses due to the entrance of air into the serous cavities, the connective tissue, or the alimentary or genitourinary tracts.

Several pages are devoted to a discussion of these various types, and numerous examples are given.

I. W. BACH.

Adams, J. E.: Carcinoma of the Appendix. *Proc. Roy. Soc. Med.*, 1919, xii, Sect. Surg., 37.

American authors have stated that routine microscopic examination of appendices show carcinoma in from 0.4 to 0.5 per cent, but in Adams' opinion this condition is far from common in England though microscopic examination has not been a routine procedure.

In one series of cases, 54 per cent of the patients were under 30 years of age, the youngest being under 5 years. One case was that of a child only 7 days old.

In practically every instance reported the appendix was removed for an attack diagnosed as appendicitis and the diagnosis made later by microscopic examination.

The vast majority of the carcinomata were of the spheroidal- or basal-cell type. The columnar-cell carcinoma was found in patients who were about 50 years of age, this observation according with the incidence of the same type in other parts of the intestinal tract.

The spheroidal-cell type, which occurs in young children—usually at the distal end of the appendix—is characterized by slow growth, the absence of early metastases, and rarity of recurrence after removal. In the cases appearing in later life the malignancy of the growth is that of the ordinary columnar-cell carcinoma.

The author reports a case of spheroidal-cell carcinoma in a child aged 12. Appendectomy alone was done and the patient still remains well.

I. W. BACH.

LIVER, PANCREAS, AND SPLEEN

Gibson, C.: Notes on Liver Abscess Founded on Cases at a Stationary Hospital, Palestine. *Brit. M. J.*, 1919, ii, 202.

The author reports five cases of liver abscess, dividing them from the standpoint of position into epigastric and subdiaphragmatic. In the epigastric type diagnosis was comparatively easy, operation was successful, and convalescence rapid. In the subdiaphragmatic type the diagnosis was complicated by the presence of signs of pneumonia and was made with certainty only at the postmortem examination. A history of dysentery was obtained in only one case, and a history of attacks of diarrhoea in two cases.

Pain was a constant symptom. Tenderness developed at some stage of the process and was maximal over the site of the abscess. Enlargement of the liver was present in three cases of the epigastric type, and was not detected in the subdiaphragmatic group. Pyrexia was present in all cases. Sweating was pronounced in two cases and then only during terminal collapse. In none of these instances was amœba histolytica found in the fæces. In two cases it was discovered in the pus of the abscess.

The author emphasizes the fact that in the subdiaphragmatic type of liver abscess the differential diagnosis from right basal pneumonia rests upon the presence of abdominal symptoms, swinging temperature, and tenderness over some part of the hepatic area before any pulmonary signs are noted in the right base.

The diagnosis from malarial hepatitis depends upon splenic enlargement and the presence of malarial parasites in the blood. In the cases which came to operation the abscesses were single. Multiple abscesses were discovered in the cases that came to postmortem examination. W. J. TUCKER.

Talbot, P.: Fifteen Cases of Liver Abscess: An Analysis of Symptoms and Treatment. *Brit. M. J.*, 1919, ii, 375.

Of 450 non-dysenteric soldiers in the Liverpool Tropical Hospital, 7.8 per cent were found to be infected with entamœba histolytica or its cysts. In India 33 per cent of 2,000 soldiers who had previously been in Mesopotamia were carriers of the entamœba.

An analysis of 15 cases of proved liver abscess treated by the author at Baghdad showed that the chief symptoms in these cases were general enlargement of the liver, continuous or remittent pyrexia, leucocytosis, a local tender spot over the liver, signs of irritation at the base of the right lung, rapid wasting, and heavy sweats.

Other signs and symptoms of value are local bulging, pallor, rigors, referred pain in the right shoulder, and rigidity of the right rectus.

In a few cases drainage was instituted either through the chest wall or the abdomen. In the

author's opinion, however, the majority of such cases can be successfully treated by aspirating with an ordinary 20 cubic centimeter glass syringe. It does not appear to be necessary even to withdraw all the pus. After aspiration every patient was given a course of hypodermic injections of emetine hydrochloride, 1 grain daily for one week and then on alternate days until 12 or 14 grains had been given. Whenever possible, 1 grain of emetine was given a few hours before operation so that emetine would be contained in the first serum to flush the walls of the abscess.

In 15 cases treated there was 1 death which occurred following drainage through the chest wall.

J. A. H. MAGOUN.

Villard, E.: Eighty Cases of Choledochotomy for Calculus (80 cas de cholécotomie pour calculs). *Presse méd.*, Par., 1919, xxvii, 615.

Villard says that the old idea that all calculi in the common duct had migrated there from the gall-bladder should be abandoned as there is a true common-duct lithiasis which has its own individual characteristics and symptomatology. Moreover, even if some of these calculi were originally formed in the gall-bladder, they may increase in the common duct. Very often common-duct stones are quite different in form and structure from gall-bladder stones.

Clinically the objective symptoms are few, but the author lays stress on the presence of a definite painful spot below the false ribs on a line adjoining the umbilicus and the right coracoid apophysis. The symptomatic triad is: (1) initial painful crises; (2) a sudden elevation of temperature; and (3) a more or less temporary icterus within forty-eight hours.

As treatment a choledochotomy with drainage is the operation of choice. Cholecystectomy is preferable, however, if the gall-bladder is small, retracted, and reduced to a cicatricial stump.

In 2 cases Villard did a transduodenal section and removed a calculus from the ampulla of Vater. This procedure permits the immediate and complete closure of the abdomen. Five cases were treated by posterior transpancreatic section. In 2 cases in which excellent results were obtained the common duct was immediately sutured without drainage of the bile passages.

Owing to the results of biliary infection and the fact that the diagnosis is usually made late, the prognosis is generally unfavorable. In the first series of 40 cases there were 16 deaths, and in a second series of 40 cases, 9 deaths. In the author's opinion the best sign for a good prognosis is a slow pulse before operation.

W. A. BRENNAN.

Nicoll, J. H.: Remarks on the Frequency, Diagnosis, and Treatment of Chronic Pancreatitis. *Brit. M. J.*, 1919, ii, 625.

The author states that the well-known pathologic tripod of abdominal conditions formed by diseases of

the appendix, biliary apparatus, and gastroduodenal tract should be replaced by a quadrupedal figure one support of which represents pancreatitis.

He mentions the two forms of acute and chronic pancreatitis and for acute hemorrhagic or necrosing pancreatitis advocates immediate exploration and operation. Chronic pancreatitis should be diagnosed more frequently. Factors which may prove helpful in the diagnosis are glycosuria, fatty diarrhoea, fats and fatty acids in the stools, jaundice, Schmidt's test, and Wohlgemuth's test.

The author emphasizes the value of exploring the pancreas during the course of an abdominal operation in which the pathologic condition found does not account for the symptoms. The pancreas is responsible for many abdominal complaints and may often simulate disease of the stomach or gall-bladder. Therefore it should be inspected and palpated, and if necessary, a small piece should be excised for microscopic examination. With careful technique this may be done without undue risk.

The treatment is both surgical and medical. The surgical treatment consists of drainage of the gall-bladder or the common duct or a cholecyst-enterostomy. The latter is preferable when conditions permit. The author advises against cholecystectomy when any inflammation is found in the pancreas. All chronic cases of pancreatitis, he asserts, may be cured by careful, long-continued, medical treatment.

R. D. MUSSEY.

MISCELLANEOUS

Ansell, P. L.: The Roentgen Study of Visceroptosis.

Am. J. Roentgenol., 1919, vi, 459.

Ansell uses Stiller's classification of physical habitus (hypersthenic, sthenic, hyposthenic, and asthenic) and considers in detail the roentgen findings in each type. Particular attention must be given to morbid changes which may accompany ptosis. Duodenal ulcer is apt to be masked by the dietary management of ptosis as most ulcer patients have no distress while food is in the stomach. Gastric hypertonus with hyperperistalsis, particularly in patients of the asthenic habitus, should lead to careful search for ulcer. If only moderate and transitory, search should be made for gall-bladder disease or appendicitis. Deformities of the duodenal cap are often simulated when the pylorus and duodenum are in fairly normal position but there is not sufficient gastric peristalsis to fill the pyloric antrum and duodenal bulb properly.

The success of any rational treatment for visceroptosis depends primarily upon a reasonable certainty that there are no complications. In the case of patients belonging unquestionably to the hyposthenic and asthenic types, a detailed history and a careful roentgen study of the abdominal viscera will do much to decrease the percentage of failures. The roentgen study of such cases should be the rule rather than the exception.

D. R. BOWEN.

SURGERY OF THE EXTREMITIES

DISEASES OF BONES, JOINTS, MUSCLES, TENDONS. GENERAL CONDITIONS COMMONLY IN THE EXTREMITIES

Delrez, L.: War Wounds of the Joints (Plaies de guerre des articulations). *Arch. méd. belges*, 1919, lxxii, 513.

The two elements against which the articular synovial membrane must be protected are blood and infection. Any effusion of blood in a joint must be completely evacuated whether the joint lesion is open or closed, a hæmarthrosis, or a penetrating wound. Success depends upon the thoroughness of such evacuation and the protection of the joint cavity against infection.

The object of operation is the surgical sterilization of the wound. The wound should be opened up and all contused tissues excised in the same way as in other lesions due to projectiles. The author does not use antiseptics, and sutures the wound immediately without drainage. When, as is usual, a secondary inflammatory exudate appears, it is generally aseptic and disappears spontaneously.

In the postoperative treatment the author has tested the immediate active mobilization recommended by Willems. When the joint wound is complicated by lesions of the soft parts or of the bone, however, experience has demonstrated that the indications for this method are restricted. In such cases the author prefers temporary immobilization lasting from four to eight days, i.e., until cicatrization has progressed sufficiently so that there is no danger of complications due to sepsis.

The object of immediate active mobilization is to fight muscular atrophy and prevent joint stiffness. The most efficacious measure against such conditions is voluntary mobilization. In the author's opinion, however, immobilization of short duration does not seriously favor joint stiffness.

Delrez has treated 190 wounds of the large joints. Infection was present in 21 cases, in 16 in the knee-joint. Five of these cases of infection were cases of purulent arthritis. Amputation in 1 of them was followed by recovery, and resection in the other 4 by 2 deaths and 2 recoveries with ankylosis.

Among the cases treated by arthrotomy and active mobilization were 3 cases of staphylococcic arthritis in which there was complete recovery with normal movement. In 4 cases of purulent streptococcic arthritis the recovery of movement was either total or considerable. In 1 case the operation was followed by death and in another amputation was necessary. In 2 cases passive mobilization was practised as active mobilization was impossible.

As a rule, active mobilization according to the Willems method gave satisfactory results in cases in which it was indicated. When impracticable, as,

for example, in cases of severe lesions of the extensors of the knee, passive mobilization was substituted. While undoubtedly in such instances the cure of the arthritis was more difficult and complicated than in cases treated by active mobilization, the drainage of the joint being less thorough, the final result was much better than that which would have been obtained by resection.

W. A. BRENNAN.

FRACTURES AND DISLOCATIONS

Smith, M. K.: Gunshot Fractures of the Humerus. *Ann. Surg.*, 1919, lxx, 430.

The author reviews 152 cases of gunshot fractures of the humerus in the American Red Cross Military Hospital No. 2 at Paris. After primary operation to remove detached bone fragments and provide thorough drainage, all of these cases were treated by suspension and traction without a fixed splint as follows:

The arm was supported in a sling from an overhead pulley. The forearm was suspended by glued bands in the same manner, but with the attachment further away from the body. Traction was obtained by bands glued to the arm if the wound permitted this but more often by a band encircling the arm just above the elbow which was attached by a pulley to the frame or an abduction board placed under the mattress.

The advantages of such treatment are the maintenance of a favorable position as to circulation and drainage, the comfort of the patient, the control and maintenance of reduction, and the earlier restoration of function. This treatment also allows massage and exercise of the elbow and shoulder. When firm union has developed, the patient is gotten out of bed. In order to assure complete mobilization he is then not permitted the use of a sling. Sequestration must be watched for and sequestra removed as soon as separated but not earlier.

The author discusses the type and location of the fractures, the causative missile, and the kind of infection. Fractures of the shoulder joint usually came to resection of the humeral head followed by union with the scapula. The average date of beginning union was twenty-four days, while that of firm union was forty-seven days. The anatomical results were excellent, the alignments being governed by the proper relation of the suspensions of the arm and forearm.

Twenty-nine patients are recorded as having 31 nerve injuries, not all of them complete. These were distributed as follows: musculospiral, 25; ulnar, 3; median, 1; musculocutaneous, 1; and brachial plexus, 1. There were 6 cases of non-union and 7 of delayed union. Causes retarding the return of function were damage to the musculature of the arm, partial paralysis, and infection.

The 3 cases of simple fractures required the same amount of time for union. Simple fractures are most satisfactorily treated by suspension and traction.

The article is illustrated with excellent superimposed photographs showing the final range of motion.

R. G. PACKARD.

Van de Velde, J.: Fractures of the Lower Third of the Femur. *Ann. Surg.*, 1919, lxx, 461.

The author classifies open fractures of the lower third of the femur as follows:

1. No comminution. These cases are treated by Depage's wiring if primary suture of the wound is planned. For secondary suture a Parham band or bronze wire is used for one month.

2. Slight comminution. Detached bone fragments should be thoroughly removed. Primary suture is dangerous. Delayed primary or secondary suture is indicated. Ice tongs or Steinmann pins should be used if low wounds do not contra-indicate. Willems' screws are not recommended because they do not hold well in the cancellous tissue of the condyles; they loosen under traction, cause pain, and pull out in two or three weeks. The pin is best and should be inserted under the fluoroscope just above the condyles and anterior to the axis to correct the posterior displacement due to the pull of the gastrocnemius. It should not be left in place longer than six weeks.

3. Much comminution. In this type when 1 or 2 inches of the bone have been destroyed, extensive careful excision is necessary. All detached bone fragments should be removed. Vertical suspension of the lower fragment with traction on the leg in the horizontal plane is recommended. Shortening of the femur is prevented by traction with a Chutro stirrup or by Gillam's method.

D. H. LEVINthal.

SURGERY OF THE BONES, JOINTS, ETC.

Duval, P.: The Treatment of War Wounds of the Joints. *Surg., Gynec. & Obst.*, 1919, xxix, 222.

The radical changes that have taken place in the surgical treatment of war wounds of the joints have been due to the resistance of the joints to infection and the adoption of the practice of operating as early as possible. Immediate suture is based on the following principles:

A war wound is contaminated directly by bacteria which are carried into it by the missile and fragments of clothing. Infection develops, but the defensive reaction of the synovial membrane is much more efficacious than that of the other tissues; the synovial membrane seems to possess a bactericidal power. An aseptic state of the synovial membrane persists for a relatively long time—for twenty-four, forty-eight, and sometimes even sixty hours—before septic arthritis develops. By early operation all contaminated tissues, including bone tissues and the contaminated edges of the synovial per-

foration, may be excised and all foreign material removed. The surgical wound and the joint cavity are then aseptic and complete suture without drainage may be done.

In 1917 and 1918 the surgical treatment of war wounds of the joints was based on the following principles:

1. Early operation.
2. The removal of all foreign substances and total excision of the track of the missile.
3. The careful cleaning of the fractured surfaces and complete suture of the joint without drainage.
4. Active and immediate mobilization.
5. The greatest possible preservation of the parts, immediate resection being limited to injuries in which there is extensive comminution.

When the bone injury is complicated by the presence of more or less extensive fissures, the latter must be opened with a lever in order that their walls may be scraped, the bone fragments being then again replaced.

When the joint is well cleaned, the operative procedure should be the same as for a closed fracture of a joint.

The re-establishment of a normal joint outline is most important for experience has demonstrated that if the general outline of the joint surface is preserved good functional results may be obtained even when there is a partial loss of the joint surface.

The treatment of the serous fluid in the joint is also very important. This fluid must be dried up as completely as possible with dry sponges in all parts so that no blood or fibrinous coagulum remains.

The terminal suture should be done layer by layer, the peri-articular ligamentous, fibrous, and muscular planes being preserved as much as possible. No drainage should be used.

Immediate active mobilization in cases of joint injuries insures ultimate perfect functional results even when there is comparatively extensive bone destruction. Bone surgery may be done twenty-four or even thirty-six hours after the injury.

L. C. DONNELLY.

Brenizer, A. G.: Bone, Fascia, and Fat Grafting. *Charlotte M. J.*, 1919, lxxx, 111.

Up to November, 1916, only 10 cases of the use of total autoplasmic bone transplants to fill skull defects had been reported in the literature. Defects in the skull show little spontaneous tendency to become filled with bone, thus differing especially from defects in the long bones.

In two cases of skull defects practically no filling-in had occurred after six and fifteen years respectively but when autogenous transplants from the tibiae were inserted they became filled in evenly in six weeks. Therefore such transplants will be effective where there is no spontaneous tendency to heal. The perfect filling in of the tibiae showed that defects in the long bones will grow to the point demanded by the functional forces and no further.

The bone graft acts as a stimulus to osteogenesis

(Albee), and the cells for osteogenesis are supplied by the periosteum, endosteum, and Haversian canals. A few cells are supplied also by the graft itself (McWilliams).

Autogenous grafts will grow successfully when the proper precautions are taken for asepsis and immobilization and are the best as other kinds do not grow. The latter, however, when used as temporary splints may stimulate repair and for this reason are preferable to metal implants.

Fascia was first used as a transplant in plastic surgery by Kirschner. Its advantages are that it heals without reaction, tends readily to become incorporated into its new bed, even without perfect asepsis, and is easily obtained in large amounts. No harm has ever resulted from the use of large grafts of fascia lata. The fascia tends to take on the form and function of the parts to which it is transplanted. It has been used for many and varied purposes, including the bridging of defects in muscle, tendon, and the abdominal wall, to fix in place parenchymatous organs such as the kidneys, to occlude hollow organs, to cover over structures such as nerves, the brain, and amputation stumps, and to mobilize the resected ends of joints. Autogenous transplants are best, but homogenous grafts from the same blood group may be used.

Fat is invaluable as a transplant in spite of its poor resisting power (Binnie). It may be used to arrest bleeding of the liver and kidneys, to fill defects in bone and those resulting from scars, and to close suppurating or tuberculous cavities. For hæmostasis, however, autogenous muscle transplants are best.

The author gives the reports of 9 cases illustrative of bone, fascia, and fat transplantation. These include 2 cases of filled skull defects, a thyroidec-tomy and a cheek scar which were corrected cosmetically with fat and fascia, and 5 cases in which bone grafts were implanted in the spine. In all, the results obtained were excellent. M. H. HOBART.

ORTHOPEDICS IN GENERAL

Byrne, J., Taylor, A. S., and Boorstein, S. W.: **Early Surgical and Orthopedic Treatment of Hemiplegia.** *Surg., Gynec. & Obst.*, 1919, xxix, 398.

The authors' conclusions are as follows:

1. Early operation within from two to four weeks, or even after a much longer period, may be indicated in hemiplegia: (1) when the intracranial pressure threatens medullary strangulation, whatever the site or nature of the lesions; (2) in extradural hæmorrhage with or without intradural hæmorrhage or cerebral contusion, when cerebral compression threatens death or permanent disability; (3) in intradural hæmorrhages of traumatic or spontaneous origin when cerebral compression threatens death or permanent disability; and (4) in intracerebral hæmorrhage when focal compression threatens death or permanent disability.

2. A subtemporal decompression and evacuation of the clot is a simple procedure and should be done in every case of fresh hemiplegia when the indications mentioned are present.

3. If the patient is unconscious an anæsthetic need not be used as the shock of the operation is slight.

4. Even in old cases of hemiplegia decompression is of benefit.

5. Decompressions should be done even in cases due to embolism or thrombosis.

6. The deformities and contractures of hemiplegia can be prevented.

7. Patients with hemiplegia should be put in the same category as those with anterior poliomyelitis and should be given proper orthopedic treatments from the beginning.

8. Plaster splints should be applied immediately to prevent contractures.

9. Massage and exercises are indicated and should be used intelligently.

10. The patients should be taught the proper use of the limbs.

11. In old and neglected cases deformities should be corrected and recurrences prevented.

L. C. DONNELLY.

Brown, A. J.: **A Contribution to the Study of Stiff and Painful Shoulder.** *Surg., Gynec. & Obst.*, 1919, xxix, 381.

It is the object of this paper to suggest that a tear of the tendons of the latissimus dorsi and teres major muscles may play an important rôle in the etiology of certain cases of stiff and painful shoulder; also to point out some of the therapeutic indications in the disability caused by this lesion.

After a moderate trauma of a rather definite type the patient feels a snap in the shoulder which is followed by a severe, sharp pain. In some cases the arm falls helpless by the side. Within a small range amounting to about 10 degrees motion is not painful due to the fact that within this range the injured muscles are not placed on the stretch and consequently are not further traumatized. This fact serves as a point of differentiation between extra-articular and intra-articular lesions of the shoulder for in the latter, in which joint surfaces are involved, pain occurs at the very beginning of joint movement.

In the acute stage the treatment consists of immobilization for a short time, active motion which is begun early for short periods and always maintained within the limits of pain, the prevention of new trauma to injured or reparative structures by splinting the deltoid and inhibiting motion tending to cause such injuries, and local and general massage.

In the chronic and more severe cases it is necessary first to break up the firm scar and fibrous tissue which has formed in the tendons and the adhesions which have formed in the surrounding axillary tissues; also to overcome the shortening of

the muscles which has taken place as the result of carrying the arm in the sling position for a considerable length of time.

The article is summarized as follows:

1. Stiff and painful shoulder of a certain type falls into the general class of muscular strains about joints and is centered in the tendons of the *teres major* and *latissimus dorsi* muscles.

2. The condition manifests itself by: (a) pain on stretching the injured muscle; (b) a distinct, localized point of tenderness over the site of injury

in the tendon and at its attachment to the bone; and (c) the early development of a moderate amount of atrophy of the deltoid muscle due to involvement of the circumflex nerve in the inflammatory and reparative processes.

3. The condition is amenable to treatment along lines which have proved successful in similar conditions in other parts of the body. This treatment is conservative and directed toward preventing trauma and hastening the resolution of the oedema and exudative processes.

L. C. DONNELLY.

SURGERY OF THE NERVOUS SYSTEM

Danforth, M. S.: The Diagnosis and Treatment of Nerve Injuries. *J. Orthop. Surg.*, 1919, xvii, 593.

This article is based on a study of patients with nerve injuries at the Edinburgh War Hospital, and outlines the routine points in the medical history, examination, and pre-operative treatment. Each case history gives the date and character of the wound, the amount of suppuration, the time of the occurrence of paralysis, and the increase or decrease of paralysis and anæsthesia.

The records of the local examination which followed the routine general examination include information as to the location of the wounds or scars; the character of the scars, whether soft or indurated, adherent or non-adherent; the limitation of motion in neighboring joints; the voluntary power and response to faradism and galvanism of individual muscles; cutaneous sensibility as determined with a wisp of cotton and a pin prick; the trophic changes; and the element of distal tingling.

Complete loss of voluntary power with loss of faradic excitability and slow galvanic response associated with anæsthesia and analgesia over the area supplied by the nerve and the absence of tingling distal to the site of the injury indicate physiological loss of continuity in the nerve trunk.

Before operating, the general working rule was to wait for from six weeks to two months after complete wound healing. This period was employed also to improve the muscle nutrition, correct the deformities, and restore the flexibility of the joints. Appropriate splinting protected the muscles from stretching. Hot soaks were followed by massage, active and passive motion, and electrical stimulation. Deformities were corrected by manipulation with or without an anæsthetic. The restoration of flexibility of the joints, most difficult in the smaller joints, was accomplished by massage and hydrotherapy in some instances, but best of all by elastic traction in the line of deformity. R. G. PACKARD.

Babcock, W. W.: Questions in Relation to the Treatment of Peripheral Nerve Injuries. *Med. Rec.*, 1919, xcvi, 664.

About 420 patients with evidence of peripheral nerve injury were admitted to Ft. McPherson be-

tween October 1, 1918, and June 1, 1919. Over 510 nerve lesions were studied in these patients, and 328 operations were performed upon peripheral nerves. More than half of the injured nerves (165) were subjected to neurolysis, usually with herstage, and 163 complete or partial divisions of nerve trunks were treated by suture.

In this series injuries of the ulnar nerve were first in order of frequency, those of the musculospiral nerve were second, and those of the median nerve, third.

A careful statistical study by Spear showed that the patients subjected to operation made better and more continuous progress than those with less serious injuries who were treated only by massage, electricity, etc. In a series of 75 cases treated by herstage it was found that although in a few the condition was temporarily made worse by the operation, at the end of two or three months there was usually a decided improvement. After neurolysis a few patients improved very rapidly but in a large proportion the improvement was slow—almost as slow as after suture. After suture no immediate improvement was observed. The partial splitting of a nerve trunk in its component bundles and the rerouting of the nerve filaments through muscle, intermuscular planes, or under subcutaneous fat did not seem to jeopardize function.

The author's conclusions as a result of the study of these cases may be summarized as follows:

1. In the diagnosis the most important evidence is obtained from the sensory and motor loss; the former is determined chiefly by mapping the loss to tactile and painful impressions; the latter by studying voluntary contractions in muscles. Electrical reactions may be misleading in the preliminary examination and the electrical return may so lag behind the sensory and motor return as to have little value in determining regeneration.

2. Indications for operative intervention are: (1) persistent total or partial interruption in a nerve; (2) doubtful nerve lesions in which careful study has shown the desirability of exploration.

3. Re-operations are justifiable after neurolysis when improvement has not occurred after proper postoperative treatment in three months, and

sometimes as early as one month. After neurorrhaphy and nerve grafting re-operation is justified if twice the normal time for neuraxes to penetrate from the lesion to the periphery has elapsed without evidence of regeneration.

4. Neuraxes should penetrate the nerve trunk distal to the line of suture at the rate of about 1 millimeter each day, or 1 inch a month.

5. The time for operation after the healing of gunshot wounds depends on the nature of the wound. Superficial granulating surfaces do not contra-indicate immediate operation provided the granulating surface is properly sterilized by a thorough preliminary application of saturated zinc chloride solution. The adjacent skin should then be carefully cleansed, the scar and granulating area excised *en masse*, and all instruments changed. There is much greater danger from exposing or operating upon bone that has been the seat of compound fracture or osteomyelitis, and therefore it is wise to operate on the bone at a separate time.

6. In case of healed, associated injuries of the soft tissue, a bone, and a nerve, the nerve should have first consideration.

7. Four operations are permissible for nerve injury: end-to-end suture, neurolysis and nerve trunk exploration, hersage or nerve fiber dissociation, and, in very rare cases, nerve grafting.

8. Physiotherapy should be begun as soon as the operative condition will permit. Gentle massage and passive movement of the exposed parts should be used, if possible, on the third day. Progressive, carefully graded electrical treatment without tension in the operative field may usually be begun about one week after operation.

9. The patient should be examined for return of function every two weeks after neurolysis and every four weeks after suture or grafting, especially during the early months.

10. A patient with injury of peripheral nerve should be considered fit for discharge from the army hospital: (1) when deformity has been overcome; (2) when sufficient sensation has returned to prevent burns or other injuries of the affected parts; (3) when pain has been relieved; and (4) when sufficient motor power has returned to all the important muscles so that progressive development will continue under ordinary use.

G. W. HOCHREIN.

MISCELLANEOUS

CLINICAL ENTITIES—TUMORS ULCERS, ABSCESES, ETC.

Watson-Williams, E.: A Preliminary Note on the Treatment of Inoperable Carcinoma with Selenium. *British M. J.*, 1919, ii, 463.

The author has collected from the literature 60 cases of inoperable carcinoma treated by injections of selenium with improvement reported in 49 instances. He adds 24 cases of his own in which benefit was obtained in 19. The improvement has been most marked in carcinoma of the alimentary tract.

The physiologic action and low toxicity of selenium were studied by Duhamel in 1912. It is available for injection as a "protected" colloidal suspension of erythro-selenium beta, prepared chemically or electrically, and is a dichroic coral-red fluid. It is not very stable; in old preparations the metal is found to be precipitated. The solution is isotonized if this has not already been done by adding sodium chloride solution before injection. The author injects a dose representing 0.005 gram to 0.0005 gram of the metal. Preferably this is done intravenously, though the intramuscular injection may prove to be the method of choice in ambulatory cases. In therapeutic doses selenium appears to be non-toxic and non-cumulative.

A transient reaction which follows—slight malaise and a rise of from 1 to 2 degrees F. in temperature—is more marked in patients with extensive growths. The tumor becomes softer though no definite necrosis has been noted.

The author has observed nothing to suggest that selenium will cure carcinoma but believes that it will give enough relief to justify its use in inoperable cases.

LEDA STACY.

Harries, D. J.: Oriental Sore or Baghdad Boil. *Indian M. Gaz.*, 1919, liv, 325.

Oriental sore or Baghdad boil occurs in the tropical and subtropical regions of both the eastern and western hemispheres. As yet the method of contracting it has not been definitely settled, although it has been attributed to various parasites. The sore can be experimentally produced by contact of material from the lesion on an abraded surface. Auto-inoculation also apparently occurs. Leishman-Donovan bodies have been shown to be present in all cases. The relationship between kala-azar and oriental sore is undetermined. The Leishman-Donovan bodies in each are indistinguishable, though the two conditions never appear at the same time or even at different times in the same person. The explanation usually given is that the presence of one of them causes immunity to the other. It is possible also that the two conditions are different phases of the same disease.

Usually the disease begins as a small papule resembling a mosquito bit. This papule breaks down, forming a small crater which in some cases measures $\frac{1}{2}$ by $\frac{1}{2}$ by $\frac{1}{4}$ inch. The change may occur in a few hours or a few weeks, and may develop into the following forms:

1. A spreading shallow ulcer with an indurated and heaped-up edge. The base of the ulcer becomes

covered over by a thin yellowish scab with a layer of pale granulation tissue below. Clinically this resembles an early malignant ulcer.

2. A shallow serpiginous ulcer with an undermined but non-indurated edge.

3. A hard nodule generally $\frac{1}{4}$ to $\frac{1}{2}$ inch in diameter, slightly raised above the surrounding skin.

These various lesions may merge into each other. After healing the scar is slightly depressed, smooth and white at the center, and pigmented at the periphery. The surrounding skin is also pigmented for about $\frac{1}{2}$ inch. In almost a third of the cases the Wassermann reaction is positive.

General symptoms are usually absent except in the early stages. During the papule stage there may be general malaise, a temperature of from 100 to 102 degrees, vague pains in the joints and muscles, and slight tenderness of the nearest intercepting lymph nodes. These disappear as the papule breaks down but reappear as new papules develop. The lymph nodes usually enlarge and remain enlarged until the lesion is cleared up. In certain cases the symptoms may be exaggerated.

In the treatment internal remedies have been tried but the best results have been obtained by the intravenous administration daily or every other day of a 1 per cent solution of antimony tartrate, beginning with 5 cubic centimeters and gradually increasing the dose to 10 or 15 cubic centimeters.

As local treatment many drugs have been used but they have caused necrosis and sloughing of the sore.

Recently it has been reported that several complete cures have followed ionization. The most favorable results seem to be obtained when the lesion is in the crater stage. By this method of treatment considerable improvement at least is always observed.

The best results follow complete excision. An isolated sore should be completely excised with a margin of $\frac{1}{2}$ inch of the surrounding skin and the skin edges then sutured together in the ordinary way. Healing occurs by first intention. Multiple sores may be excised and the raw area allowed to granulate in. In some cases skin grafting may be done.

I. W. BACH.

McDowell, I. W.: Syphilis as Related to Traumatic Surgery. *Internat. J. Surg.*, 1919, xxxii, 296.

The author has noted that in many accident cases which came under his observation numbers of the patients have failed to recover or heal rapidly. This made him consider the syphilis as a possible factor.

The literature upon the incidence of syphilis gives various percentages probably because the different observers have used different materials and methods. Warthin who examined microscopically for spirochætes in the tissues in 750 autopsies at Ann Arbor estimates the incidence of syphilis in this country at 30 per cent. Some observers place it as high as 60 per cent (Thompson, St. Louis), and others (Rowntree, Minneapolis), at 13 per cent. Among negroes the incidence is higher.

Syphilis has long been recognized as a factor in the delayed healing of wounds, and should be even more carefully considered than urinary changes. Warthin found characteristic syphilitic heart lesions in all of his cases, and believes that they are the cause of many cardiac deaths, a possibility which should be taken into consideration before an anæsthetic is administered.

Spontaneous fracture due to syphilis is rare, but should be borne in mind. In cases of latent lues a slight injury may refuse to heal due to the fact that as a result of the trauma the condition has become active. Subsequently it may form a gumma and ulcerate.

The author cites cases of traumatic lesions including small ulcers of the buttocks, an ulcer of the arm, and scalp wounds which improved after the administration of specific treatment following a positive Wassermann. In one case an electric shock precipitated a multiple sclerosis in a luetic.

That other conditions may delay healing in a syphilitic was evidenced by one case of tuberculous bone which was not improved by specific treatment but was benefited only after the removal of the tuberculous focus.

The article is summarized as follows:

Syphilis is more widespread than is generally recognized, its incidence being about 20 per cent in the white race and from 40 to 50 per cent among negroes.

Latent syphilis may become active as a result of trauma, manifesting itself either as a local lesion or producing an active process at a point distant from the site of injury.

A negative Wassermann does not rule out syphilis; when the first test is negative, a provocative test should be done. Even then the therapeutic test should be made. Bone lesions often give a negative reaction, but here the X-ray is of value.

Syphilis may be present, but may not be the cause of failure of wounds to heal. M. H. HOBART.

Strachauer, A. C.: The Surgical Treatment of Traumatic Epilepsy. *Minnesota Med.*, 1919, ii, 382.

In the surgical treatment of traumatic epilepsy, the three factors necessary for success are: (1) the eradication of the causes (2) the prevention of their recurrence, and (3) prophylaxis.

Prophylaxis begins with the diagnosis of a fracture and cerebral hypertension. In order to perform a thorough examination of the skull in suspected fracture cases, all of the scalp should be shaved as a routine procedure. A complete X-ray examination with good plates is also absolutely necessary because a false sense of security may be entertained from the findings of an incomplete examination.

The point of interest in a skull fracture is the presence and the extent of damage to the brain and its membranes. Often adhesions and cysts may produce epilepsy. In two cases depressed areas were treated with autoplasmic fascia lata transplants

having a thin layer of fat, the fat side being turned down.

The author believes that all skull injuries complicated by cerebral hypertension are an indication for unilateral or bilateral subtemporal decompression. The purpose of such an operation is twofold: to prevent medullary compression and to avoid the secondary effects of compression. Chief among the latter is epilepsy which usually is general in character and not a favorable type for surgery.

Early surgical intervention is paramount in cases of traumatic epilepsy as the likelihood of betterment diminishes in inverse ratio to its duration. While the operation may not entirely stop the attacks, they are usually rendered less severe, providing a definite macroscopic lesion is removed.

The operative technique in the presence of a depression or defect is described in detail. The problem resolves itself into the prevention of adhesions of the brain to the meninges, scalp, or skull, and the supplying of the defect in the removed dura. Reference is made to the methods used by various surgeons.

The author's method differs from the others in that he employs autoplasmic transplants of fascia lata with a thin layer of fat. This he has done in eleven cases, in nine for the treatment of epilepsy, and in two as a prophylactic measure. Of the eleven patients, only one did not improve, and this one was not made any worse by the operation. Final conclusions are not yet possible because sufficient time has not yet elapsed to warrant a decision, but from the observations made so far the majority of the patients have shown marked improvement, one having been entirely cured for over four years.

A. R. HOLLANDER.

McCaskey, G. W.: The Differential Diagnosis of Hyperthyroidism by Basal Metabolism and Alimentary Hyperglycæmia. *N. York M. J.*, 1919, CX, 607.

The author presents a further discussion of basal metabolism, the metabolism of the fasting body in the resting state or the minimal quantity of metabolic change essential to the neuromuscular and secretory phenomena of the basal organic functions, respiration, circulation, and secretion. He calls attention especially to the differential diagnosis of hyperthyroidism from clinical conditions bearing some resemblance to it but points out certain limitations and states that laboratory methods are subsidiary to the clinical picture.

Basal metabolism can be quickly and accurately determined by measuring the oxygen consumption with the Benedict portable apparatus.

The application of the tests will aid in the differential diagnosis between toxic and non-toxic goiters. While hyperglycæmia is not pathognomonic of hyperthyroidism, such tests, when correlated with the clinical picture, will aid in the diagnosis as does a positive Wassermann in a suspected case of syphilis.

The work is based upon the results of the very important work of Kendall and Plummer along this line and the isolation and identification by the former of thyroxin which C. H. Mayo considers the most important advance in the chemistry of life.

The rate of basal metabolism must be regarded as a dependable index of thyroid activity at the time of observation.

W. L. STRANBERG.

Moore, B.: The Balance of Colloid and Crystalloid in Cholera, Shock, and Allied Conditions. *British M. J.*, 1919, II, 490.

The author discusses the disturbance of equilibrium between the colloids of the blood and body cells, that is, proteins, lipoids, and crystalloids such as sodium chloride in common solution or suspension, with reference to cholera, shock, and allied conditions. The positive effect of the injection of blood proteins, gelatin, and gum acacia in shock due to hæmorrhage, surgical injury, or prolonged anæsthesia as compared with the failure of hypertonic saline is due to the fact that the colloid cannot be eliminated while the salines are treated as foreign bodies by the kidneys and intestines and rapidly excreted. These colloids serve to anchor inorganic salts and therefore preserve the equilibrium of crystalloid and colloid not only in the blood but also in the brain and heart. That there is such an interaction of absorptive character between colloid and crystalloid is clearly shown by the definite changes in osmotic pressure following variations in the concentration of the salines in which the colloid is in solution.

Two series of experiments are quoted which demonstrate that, when injected intravenously, a solution of gum acacia in water or saline as recommended by Bayliss will hold a certain amount of saline in the blood, the total salt content of the blood will rise, and the condition of the gum will change so that its molecular weight is only one-fourth to one-third of its former value. The colloids of the cells are affected in like manner.

The good effects of hypertonic salines in cholera are due to a deficiency in the body of salines and an excess of toxic colloids. The injected salines combine with the toxic colloids and more rapid elimination by intestine and kidney is favored.

In shock the colloidal molecule is too large to pass out. Therefore the crystalloid is retained and the blood volume rises and is kept up.

Examples are drawn by the author from biochemistry to prove the peculiar relation between the colloid and crystalloid and their interdependence in various conditions such as anaphylactic shock, fermentation, Bordet-Gengou reaction, etc. The absence of anaphylactic shock in the presence of excess of saline is explained on the basis of a reaction between the crystalloids and colloids which destroys the delicate lability necessary for the reaction.

In the author's opinion, the delicate equilibrium between the colloids and crystalloids of the body is

more ancient from the point of view of evolution than the regulation of body temperature. The union is very slight and molecular, not atomic. It is very definite, however, and life cannot be maintained without it.

W. J. TUCKER.

Miller, A. H.: Surgical Shock and Its Relation to Anæsthesia under Varying Conditions. *N. York M. J.*, 1919, cx, 681.

The picture presented by the victim of shock is clearly defined. The voluntary muscles are flaccid. The skin is cold. The color is ashy or cyanotic. Perspiration is profuse, appearing in beads on the face and soaking the clothing. The pupils are dilated. The reflexes are inactive. The pulse is small and usually rapid. The blood pressure is lowered. The respiration is superficial and sometimes irregular or halting. Consciousness may be acute or depressed. There is reduced sensibility to pain. The whole appearance represents acute, profound prostration.

"Pure shock," "wound shock," "experimental shock," and various theories as to the causation of shock are discussed. The author concludes that the belief that shock is apt to occur in patients under a light degree of anæsthesia has become an obsession in the minds of those belonging to the surgical profession. This belief, however, is not based upon facts, for while cardiac inhibition might develop under an entirely insufficient general anæsthesia, there is no evidence that shock ever resulted either experimentally or in practice from a reasonably light anæsthesia. A complete abdominal hysterectomy, if free from hæmorrhage, may be performed without change in the blood pressure or pulse rate under such a light anæsthesia that it may be necessary frequently to restrain the patient's limbs and expiratory phonation persists throughout. The condition known as surgical shock, when not the result of hæmorrhage, is frequently an anæsthetic toxæmia.

ISABELLA HERB.

Lee, R. I.: Field Observation on Blood Volume in Wound Hæmorrhage and Shock. *Am. J. M. Sc.*, 1919, clviii, 570.

The author attempts to determine the therapeutic application of blood transfusion and the infusion of blood substitutes, and to evaluate these methods by observations made in the field during the war.

The observations reported indicate the importance of blood volume in wound hæmorrhage and shock. Profound disturbances of blood volume are always serious, and if maintained for any considerable period usually result in death. It seems evident that the human mechanism can tolerate greater changes in the oxygen-carrying constituent, the hæmoglobin, than in the blood volume. This coincides with the well-known clinical observation that hæmorrhage results at first in a lowered hæmoglobin or, in other words, that the blood volume is restored at the expense of dilution of the hæmoglobin.

Blood volume can be easily and roughly estimated

by comparative readings of the hæmoglobin percentage before and after the intravenous infusion of a known amount of fluid, the formula being: the percentage drop in hæmoglobin after the injection: the original percentage of hæmoglobin :: the amount of the injection: x. A knowledge of the blood volume gives adequate data for the establishment of rational therapy.

It was observed that the milder cases of wound hæmorrhage and shock require only an increase in the blood volume. The more severe cases require an increase in both blood volume and the oxygen-carrying constituent. This double requirement is met in part by transfusion. When transfusion is indicated, however, it is usually desirable to increase the blood volume still further by the administration of fluids by mouth and by rectal injections.

Continued observations on the blood volume give valuable information also as to the prognosis. When in the cases studied the blood volume was maintained at a satisfactory level the prognosis usually was good. When it could not be maintained, and when, despite all methods of administering fluids, the blood tended to reconcentrate, the prognosis was unfavorable.

A general study of blood volume strongly suggests certain procedures for the prevention and control of the associated syndrome known as wound hæmorrhage and shock. These are the administration of liberal amounts of fluids by all means or methods and the prevention of profuse sweating.

There is reason to believe that the general observations have an application beyond the special field in which they were made, as the blood volume may be seriously disturbed in various conditions which tend to derange the adjustment between the fluid intake and outgo.

P. M. CHASE.

BLOOD

Harrop, G. A.: The Oxygen and Carbon Dioxide Content of Arterial and Venous Blood in Normal Individuals and in Patients with Anæmia and Heart Disease. *J. Exper. M.*, 1919, xxx, 241.

The author summarizes his investigations and data as follows:

1. Determinations were made of the oxygen content of the venous and arterial blood of 15 essentially normal persons at rest in bed.

2. The percentage saturation of the arterial blood varied between 100 and 94.3. The average was 95.5 per cent.

3. The oxygen consumption varied between 2.6 and 8.3 volumes per cent.

4. The oxygen content and the percentage saturation of arterial blood taken at close intervals from 3 different peripheral arteries of a normal person showed values agreeing within the limits of error. Analyses of the blood gases of a normal person at rest and after exercise demonstrated a lowering of

the percentage oxygen saturation of the arterial blood and a diminished carbon dioxide content after exercise.

5. In 3 persons with severe anæmia the saturation of the arterial blood did not differ from the normal. Very low absolute values were found for the oxygen content of the venous blood, but the normal oxygen consumption was maintained.

6. The carbon dioxide content of the arterial blood from 10 normal persons varied between 54.7 and 44.6 volumes per cent. That of the venous blood varied between 60.4 and 48.5 volumes per cent.

7. During rest in bed no deviations from the normal values for oxygen and carbon dioxide were found in the venous and arterial blood of patients with cardiac disease without arrhythmia and well compensated.

8. A series of determinations was made upon 9 patients with cardiac disease with varying degrees of decompensation. In 7 the percentage oxygen saturation of the arterial blood on admission was abnormally low. With the return to compensation and the clearing up of pulmonary symptoms, the percentage saturation of the arterial blood returned to normal in 4 of these patients.

9. In a case of long-standing mitral endocarditis with auricular fibrillation it remained low over a period of one month of observation.

10. In a case of chronic myocarditis secondary to emphysema and chronic bronchitis, it remained low throughout the period of observation.

11. Normal values for the percentage saturation of the arterial blood were found in 2 persons with decompensated aortic disease but without physical signs of extensive pulmonary involvement.

12. The oxygen consumption tended to be high in persons with cardiac disease during the periods of marked decompensation and to be lower as compensation was regained.

13. The data indicate that, at least in many circulatory diseases, during compensation and particularly when there are physical signs of pulmonary congestion, there is a disturbance of the pulmonary exchange, as indicated by the lowering of the percentage saturation of the arterial blood with oxygen.

G. E. BEILBY.

Fredericq, H.: Blood Changes in the Wounded and in Those Who Have Been Operated Upon (Modifications du sang chez les blessés et les opérés). *Arch. méd. belges*, 1919, lxxii, 569.

Prior to the war it was known that operations were followed by leucocytosis, especially of the neutrophile polynuclears. Also immediately after an injury an increase in the number of leucocytes is observed, the number of white cells in some instances reaching 50,000 per cubic millimeter of blood. This leucocytosis is independent of all bacterial influence. It may be produced experimentally in dogs by aseptic section of the muscles.

General anæsthesia by itself has a manifest in-

fluence on leucocytosis, but does not, of course, explain the leucocytosis of wounded men not yet operated upon or operated upon under local anæsthesia.

The author is of the opinion that post-traumatic leucocytosis is not merely a polynucleosis. He has been able to show that in the wounded and those who have been operated upon the increase in the number of mononuclears has an important part in the leucocytosis following trauma.

An increase in the polynuclears, however, is the earliest and most important factor, the number of these cells reaching five or six times the normal number while the increase in the mononuclears is rarely more than three or four times the normal.

The beginning of a marked post-traumatic leucocytosis is characterized by the appearance of numerous forms of very young neutrophile polynuclears, the metamyelocytes of Pappenheim. In severe war and operative traumatisms they are found in considerable quantities in the blood after from ten to twelve hours. Toward the fifth day a notable and lasting increase in the eosinophiles is found.

With regard to the chemical or biological modifications in the blood of patients wounded or operated upon, it has been shown that the reserve alkali of the blood serum undergoes important changes. The lowest figure for the reserve alkali is found to correspond to the maximum infection. Also in shock the alkaline reserve tends to diminish, due to a mechanism in which the decrease in the blood pressure plays the most important part. Whenever the pressure falls below 60 millimeters of mercury there is a serious reduction in the reserve alkali.

Another factor which undergoes notable variations is the antitrypsin index. Following severe injuries there is a notable increase of antitryptic power, especially if there is fever. This increase fails, however, if there is a disturbance in the circulation (such as severe hæmorrhage), in septicæmia, and in intoxications due to asphyxiating gases.

Severe injuries have a special effect on the function of the liver as well as upon the blood. In shock there is a decrease in hepatic glycogen. Some of it is taken up by the leucocytes which then contain more than their normal quantity. In the wounded the liver contains less glycogen and the blood more glucose.

W. A. BRENNAN.

Friedman, G. A.: Transitional Leucocytosis and Its Diagnostic Value in Chronic Appendicitis. *Am. J. M. Sc.*, 1919, dlvi, 545.

In chronic appendicitis the relative formula of transitional leucocytosis has proved a great diagnostic help. Six cases which were difficult to diagnose are reported in detail and several tables of statistics which are based on the study of 65 cases are given.

With the transitional forms of leucocytes in which the nucleus is more or less in the shape of a horse-shoe are grouped the large mononuclears, there

being no difference in their protoplasm or nuclear structure. The normal percentage is 5 (mononuclears 1 per cent, transitionals 4 per cent). This is called the relative transitional formula. The absolute transitional formula is the absolute number of transitional and mononuclears in 10,000 white cells, i.e., 500. Any variation from these figures is abnormal.

The article is summarized as follows:

1. Transitional leucocytosis or an increase in large mononuclears and transitional leucocytes, or an increase in either of them, was found in the blood of 87 per cent of patients in whom evidence of chronic appendicitis was obtained; the roentgen signs were positive in about 57 per cent of the cases.

2. There was no transitional leucocytosis in the blood of patients in whom evidence of chronic peptic ulcer was obtained nor in the blood of those in whom cholecystitis, renal stones, or other organic abdominal conditions were found at operation.

3. A transitional leucocytosis was found in patients in whom appendicitis was present with other organic abdominal conditions.

4. A hyperleucocytosis and a polynuclear leucocytosis are not found as frequently in chronic appendicitis as a transitional leucocytosis.

5. As a diagnostic aid a transitional leucocytosis is superior to the roentgen signs which are supposed to point directly or indirectly to disease of the appendix.

6. Transitional leucocytosis often persists in the blood after an appendectomy is performed.

P. M. CHASE.

Sakaguchi, K., Hayashi, I., and Yesima, S.: The Influence of Immunization Processes on the Amount of Sugar in the Blood (Ueber den Einfluss der Immunisierungsprozesse auf den Blutzuckerhalt). *Mitt. a. d. med. Fakult. d. k. Univ. zu Tokyo*, 1918, xx, 61.

Although various authors have stated that the amount of sugar in the blood shows decided fluctuations in laboratory animals following sudden changes in the external temperature, in the horse it remains nearly constant under such conditions.

In experiments on horses repeated withdrawals of about 30 cubic centimeters of blood at intervals of one-half to one hour did not have any noticeable influence on the blood-sugar values. When the tests were made after the animal has been fasting, however, there were slight fluctuations. Before and after inoculation with diphtheria toxin the blood values remained almost without change.

The authors found also that in well-fed rabbits the blood-sugar values do not rise after inoculation with fatal doses of diphtheria toxin. It might therefore be concluded that, at least in well-fed animals, diphtheria toxin does not cause an increase in the blood sugar. In several experiments on fasting rabbits a more or less distinct increase was observed after inoculation with diphtheria toxin.

Following injections of tetanus, typhus, and streptococci toxins a slight hyperglycemia was noted.

W. A. BRENNAN.

Dreyer, G., and Gardner, A. D.: The Instability of Red Blood Cells Preserved in the Method of Rous and Turner. *Lancet*, 1919, cxvii, 687.

The authors tested blood suspensions made by the method of Rous and Turner to determine whether this method preserves the corpuscles for considerable lengths of time from deteriorations which would result in changes in their reaction to hæmolytic agents. This question was of great interest because, in its promise of a stable factor, the method seemed to offer an important contribution to practical serology.

The blood suspensions made by the Rous and Turner method were tested with saponin over a period of twenty-seven days. The suspensions were maintained sterile and protected from chemical contamination from the containing vessel. For each test cell suspensions were made in salt solution to a constant hæmaglobin percentage and fresh saponin solutions were made from pure saponin weighed accurately from a source of supply kept over CaCl_2 . Readings of the amount of hæmolysis caused by the saponin were made in the Dubosq colorimeter after previously centrifugalizing the fluid free from corpuscles.

Curves are given showing the increase of hæmolysis caused by a constant dose of saponin and the decrease in the quantity of saponin required to produce 60 per cent of hæmolysis. These curves demonstrate a regular increase in sensitiveness of the cells to the hæmolytic agent as the suspensions grew older.

The authors conclude that by the method of Rous and Turner it is not possible to obtain a standard suspension of red cells of constant sensitiveness to hæmolysis and that the use of such suspensions for a standard would lead to erroneous results.

WINIFRED ASHBY.

Dufour, H., and Le Hello, Y.: Anti-Hæmorrhagic Serum (Le sérum-sérique antihémorragique). *Presse méd.*, Par., 1919, xxvii, 553.

In 1914 the authors observed a case of purpura hæmorrhagica in which anaphylaxis demonstrated hypercoagulability of the blood. They state that as a rule the first injections of an animal serum do not cause any perceptible change in the coagulation of the blood immediately following injection and that hypercoagulability can be demonstrated only when anaphylaxis or signs of serum sickness develop.

To cause hypercoagulability therefore in a hæmorrhagic patient we must be able to count on an active anaphylaxis. Richet and Besredka have shown that the most certain method of obtaining this is to give the patient an injection of a small quantity of serum from a subject in a state of anaphylaxis. The authors recommend rabbit serum

as being the most suitable for this purpose. The serum is obtained from animals which have received several intravenous injections of small doses of antidiphtheritic horse serum. When injected subcutaneously into man this immunized rabbit serum causes an almost immediate hypercoagulability, and the authors have found it capable of arresting even severe hæmorrhages. Normal rabbit serum injected into man does not increase the coagulability of the blood.

The article contains the histories of 15 cases treated in the manner described. W. A. BRENNAN.

SURGICAL DIAGNOSIS PATHOLOGY AND THERAPEUTICS

Mercier, O. F.: The Treatment of Burns with Tincture of Iodine. *Canadian M. Ass. J.*, 1919, ix, 915.

At the present time it seems to be the consensus of opinion that tincture of iodine is one of the best, if not the best, of the antiseptics. This is due to the fact that, in addition to its bactericidal action, it has the power to penetrate the skin.

With the use of iodine in the treatment of burns the old method of cleaning the wound may be done away with. The iodine should be applied in one large, generous application or, as the author describes it, in a jet. This is done by sopping it on freely by means of a large piece of absorbent cotton held in a forceps. By this method the duration of the pain is shortened and the infection is reduced to a minimum. An important point is the quality and strength of the iodine, the best being the French Iodex or the 10 per cent solution in pure alcohol, 90 degrees. The alcohol must be pure. Following this treatment a simple sterile dressing with gauze compresses is all that is necessary.

After the application of the iodine the wound covers itself with a thick, brown crust which protects the raw tissues completely. When these crusts fall off they give way to a fine, pink, and supple tissue and in no case did the author observe a retractile scar.

Infection is probably the worst enemy in burns but where iodine is used the temperature drops to normal after four or five days and remains normal.

The iodine should be applied daily. For burns of the eyelid, to which iodine cannot be applied because of the danger of injuring the globe of the eye, argyrol or silvol is recommended. Healing is much slower here than where iodine is used and occasionally ectropion results.

The treatment must be given as soon as possible after the injury. For burns of the first or second degree the application of iodine is a complete treatment. For third-degree burns it may be applied in the same way but the destroyed parts become detached, leaving a wound which must be treated by the ordinary antiseptic dressings or skin grafting. When the burn is covered by blisters, they should not be opened.

I. W. BACH.

EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

Cramer, W.: Observations of the Functional Activity of the Suprarenal Gland in Health and in Disease. *Imperial Cancer Research Fund, Report No. 6, 1919, 1.*

In the last four years a number of brief communications have been published from the author's laboratory giving a summary of experimental observations which lead to the general conclusion that the thyroid and adrenal glands, functioning together and by means of their internal secretions, form an apparatus for the heat regulation of the body. This conception of the existence of a humoral mechanism, however, is not intended to exclude that of a nervous mechanism, but rather to supplement it. The action of this humoral mechanism is briefly reviewed as follows:

The increased secretion of the thyroid hormone leads to a mobilization of the liver glycogen which is brought about indirectly by the stimulating action of the hormone on the suprarenal gland, and partly perhaps also by an increased sensitiveness of the sympathetic nerve endings to adrenalin. The body reacts to the resulting influx of sugar into the blood stream by an increased oxidation rather than by a glycosuria as might be expected from the current conception of carbohydrate metabolism. The heat production is thus increased.

This increased heat production is not dependent on the presence of preformed carbohydrate in the food or in the liver. In the absence of such preformed carbohydrate it is formed by the liver from proteins and perhaps also from fats. The increased protein and fat catabolism which is such a well-known and outstanding feature of hyperthyroidism, whether experimental or pathological, is thus explained as a secondary effect due to the increased mobilization of the liver glycogen. The increased heat production which is postulated here as resulting from an influx of sugar into the blood stream is in agreement with the recent work of Lusk who demonstrated a considerable increase in heat production after the ingestion of dextrose.

While the increased activity of the thyroid and adrenal apparatus is thus responsible for an increased production of heat, it is also able to control the loss of heat as an increased secretion of adrenalin, if sufficiently strong, will contract the arterioles and thus diminish the heat loss.

The activity of the thyroid-adrenal apparatus in relation to the heat regulation of the body is demonstrated very clearly in the experimental hyperpyrexia produced by the injection of tetrahydro-naphthylamine. The rise in body temperature which in rats and rabbits follows the injection of this substance and lasts for several hours is accompanied by an intense congestion of the thyroid gland, very active secretion of adrenalin, the disappearance of glycogen from the liver, and constriction of the superficial blood vessels so that the skin feels cold, in asso-

ciation with other effects of stimulation of the sympathetic system such as dilation of the pupils and the palpebral fissure. There is also an intense congestion of the lungs, and if the dose has been too large the animal dies with hæmorrhages into the lungs as if an overdose of adrenalin had been given. It was shown also that with such a small animal as the mouse the dose of tetrahydronaphthylamine which could be injected without producing death depended on the temperature of the room in which the animals were kept; mice kept in a warm room died from smaller doses than those kept in a cool room.

The present paper deals only with the application of this conception of the thyroid-adrenal apparatus to a number of pathologic conditions on which it has obviously an important bearing and which have become active during the past few years. The conditions referred to are bacterial infections associated with a pyrexia on the one hand and with a subnormal temperature on the other, exposure to cold, shock, hæmorrhage, anæsthesia, experimental hyperthyroidism produced by feeding with thyroid gland, and acidosis.

G. E. BEILBY.

Akaiwa, H.: A Quantitative Study of Wound Healing in the Rat. I. Cell Movements and Cell Layers during Wound Healing. *J. Exper. Research*, 1919, xl, 311.

Wound healing leading to the closure of the wound depended upon three factors: (1) epithelial movements, (2) cell proliferation, and (3) contraction of the wound. The rapidity with which the wound closed depended on the one hand upon the energy of the epithelial movements and the tissue growth proper, and, on the other hand, upon the character of the surface of the wound over which the epithelium moved. If the wound surface was unfavorable, the epithelium advanced more slowly on account of the resistance encountered.

The larger the wound, the more intense was its stimulating effect upon the epithelium and the more rapid were the movements of cells covering the defect. Larger wounds closed, therefore, relatively more rapidly than smaller wounds.

The more shallow the wound the more easily the epithelium moved over the defect owing to the character of the surface which was favorable to the movements of cells. The deeper the wound, however, the more slowly the epithelium moved over the defect because of the unfavorable character of the surface which usually offered considerable resistance to the cell movements. Shallow wounds, therefore, closed more quickly than deep wounds.

Before closure had been accomplished contraction of the wound was not noticeable in the skin of the rat; on the contrary, a retraction of the tissues surrounding the wound took place soon after the operation and led to an increase in the size of the defect. This retraction remained noticeable throughout the period preceding the closure of the wound. Therefore, in the skin of the rat contraction of the tissue did not participate in the processes

leading to the closure of the wound and did not accelerate the closure.

The epithelial movements occurred not only in the cells which advanced over the defect, but also in the neighboring epithelium, and the movement was directed toward the center of the wound. The epithelial movements represented the first response of the tissue to the wound stimulation and secondarily these movements soon called forth cell proliferation and cell growth, first in the old epithelium and later in both the new and old epithelium. These changes led to a typical variation in the number and arrangement of cell rows, the thickness of the stratum germinativum, and the size and form of the cells and nuclei respectively. These variations differed markedly in the outgrowing and the old epithelium and depended also upon the size and the depth of the wound. Furthermore, they were different in different periods of the wound healing.

G. E. BEILBY.

Jackson, D. E., and Mills, C. A.: An Experimental Investigation of the Pharmacological Properties of the Active Principle of Commercial Pituitary Extracts, and of the Comparative Action of Histamine. *J. Lab. & Clin. Med.*, 1919, v, 1.

The authors conclude that:

1. The true active principle of the posterior portion of the pituitary gland is a simple body of the sympathomimetic amine type which in the dog induces contraction of the uterus but fails to contract the bronchioles.

2. This contraction is due to the effect of the substance on nerve elements and not to a direct action upon the muscles.

3. Certain commercial pituitary extracts contain histamine in sufficient quantities to exert some therapeutic action, but histamine is never present in good preparations of the posterior portion of the gland.

MAX KAHN.

Bullock, W. E., and Cramer, W.: On the Mechanism of Bacterial Infections, with Special Reference to Gas Gangrene. *Imperial Cancer Research Fund*, Report No. 6, 1919, 23.

The condition of gas gangrene may be briefly summarized as a severe local lesion accompanied by toxæmia and followed frequently by septicæmia. But none of these three factors is in itself sufficient to account for the fulminating rapidity with which the condition may lead to a fatal issue.

On the basis of the work of McIntosh and Weinberg and others it was assumed by the authors that the organisms chiefly responsible for gangrene are bacillus welchii, bacillus oedematis, and vibron septique, and most of their observations were made with bacillus welchii on mice, a species susceptible to that organism.

It was easy to show that the site of the lesion, though important, is not a decisive factor. When injected intramuscularly a dose of bacillus welchii

of low virulence killed an animal within twenty-four hours but when injected subcutaneously it did not kill or even make the animal seriously ill. By increasing the dose or using a virulent strain, however, it was possible to kill an animal by subcutaneous injection of *bacillus welchii*. In such cases an extensive hæmorrhagic œdema with a varying degree of necrosis in the subcutaneous tissue was found at the site of injection. The macroscopic changes in the tissues remote from the site of injection which the authors state were identical with those observed after injection into the leg muscles were as follows: the kidneys were deeply congested, the bladder frequently contained a dark, brownish-red fluid, probably altered blood, the liver was dark and small, the gall-bladder distended with dark bile, the spleen small, the adrenals were deeply congested, the duodenum was dilated and of an intense yellow-pink color, the thyroid was small, and the lungs were congested.

It was possible to demonstrate readily also that the mere circulation of the organisms in the blood is not in itself an important factor in bringing about a lethal issue for if a dense emulsion of bacteria from a surface culture (in saline) was introduced intravenously into mice the animals remained unaffected and in good health even though a blood-culture demonstrated the presence of bacteria in the heart blood for at least two days after the injection.

The existence of the second factor mentioned, namely, the toxæmia, is established beyond doubt for from a broth culture of *bacillus welchii* a toxin free from bacteria was obtained which in suitable doses killed a mouse with lesions similar to those produced by injection of the living organisms. Moreover, it was possible also to protect the animals against the lethal action of both the toxin and the living bacteria by the injection of an antitoxin.

So far, the facts appear to support the view that the production of toxins by *bacillus welchii* and *vibrio septique* is an adequate explanation of the condition of gas gangrene. On the basis of this conception, however, it is difficult to account for a number of facts of considerable practical importance in the treatment of the condition. An objection which is academic is that, of the toxins prepared hitherto from various strains, the minimal lethal dose has never fallen below 0.1 cubic centimeter for a 15-gram mouse. In this respect this toxin offers a striking contrast to the toxins of tetanus and diphtheria which require very minute doses in susceptible species. Another difficulty lies in the fact that the presence of non-pathogenic bacteria in gas gangrene, such for instance as *bacillus sporogenes*, which, when injected alone, produces only slight local lesions, greatly adds to the severity of the condition. A consideration of these facts suggested that there must be additional factors which determine the lethal issue in gas gangrene.

It was found that in animals dying of gas gangrene as the result of inoculation with a broth culture of

either *bacillus welchii* or *vibrio septique* there was a lasting exhaustion of the suprarenal glands as demonstrated very clearly by the osmic vapor method. The chief changes were congestion of the cortex and great diminution of the cortical lipoid while the medulla showed an almost complete disappearance of adrenalin. Similar changes have been observed in the suprarenal glands of men dying from gas gangrene. It is the change in the medulla which is of special significance since, as Elliot has shown, a diminution of the cortical lipoid occurs in a number of septic conditions of diverse origin. The term "lasting exhaustion of the suprarenal gland" indicates not only the disappearance of adrenalin from the suprarenal medulla, but also the inability of the gland to form new adrenalin. The effect may be suitably described as an inhibition or a paralysis of the gland. It resembles the action of diphtheria toxin on the adrenal gland of the rabbit and guinea pig, but differs from it in the remarkable insusceptibility of the mouse to the action of diphtheria toxin. This inhibitory effect on the gland is diametrically opposed to a stimulation of the gland such as may be produced by the injection of tetrahydronaphthylamine or in a lesser degree by typhoid vaccine. When the suprarenal gland is stimulated by tetrahydronaphthylamine there is a massive excretion of adrenalin into the blood which is demonstrable histochemically. The secretion of adrenalin by the gland acts as a stimulus for its new formation. Although the amount of adrenalin present at a given moment in the medulla of the gland—the "load" of adrenalin—may be greatly diminished, adrenalin is constantly being re-formed and poured into the blood stream until the stimulation of the gland ceases and the medulla is again refilled to its normal capacity.

The effect of the toxin of gas gangrene, therefore, is one which tends to lead to an exhaustion and paralysis of the suprarenal glands. If this action is accepted as an important element in the lethal mechanism of gas gangrene, any factors which put an extra strain on the adrenal will add to the severity of the condition.

From the observations recorded in a preceding paper it is evident that the following conditions affect the functional activity of the suprarenal glands: (1) exposure to cold; (2) a certain type of fever such as can be produced by the injection of tetrahydronaphthylamine or in a less marked degree by the toxins of certain bacteria (streptococci, *bacillus typhosus*); (3) hæmorrhage; (4) experimental hyperthyroidism produced by feeding large doses of thyroid gland; and (5) experimental acidosis produced by the injection of acids.

The article is summarized as follows:

The observations reported show that in the lethal issue of gas gangrene the exhaustion of the suprarenal gland plays an important if not a decisive part. This exhaustion is brought about by a variety of conditions some of which are inherent in the infection while others are extraneous to it. The

factors inherent in the infection are the production of a toxin which acts specifically on the gland, the production of an acidosis, and the association with bacteria such as bacillus sporogenes which by themselves are non-pathogenic. The extraneous factors are exposure to cold, physical exhaustion, hæmorrhage, anæsthesia, and, perhaps also, mental excitement. All these diverse conditions put additional strain on the suprarenal glands, and by so doing add their effect to that of a toxin which by itself is of comparatively low toxicity. It is therefore of importance in the treatment of gas gangrene to watch the adrenals and guard them against exhaustion.

G. E. BEILBY.

Jacobs, W. A., and Heidelberger, M.: Chemo-therapy of Trypanosome and Spirochæte Infections. I. N-Phenylglycineamide-p-Arsenic Acid. *J. Exper. M.*, 1919, xxx, 411.

For a number of years the writers have been engaged in synthesizing certain new types of organic arsenic compounds for the treatment of experimental trypanosome and spirochæte infections. Although much of their effort has been given to the study of trivalent arsenicals, attention was at first confined to the development of compounds containing arsenic in the pentavalent form as presented by the arsonic acids. This group seemed best suited for the synthetic procedure which was employed and afforded the best opportunity to obtain such information as to the relationship between the chemical structure and biological action as would be useful for further work. Moreover, it was felt that if a practicable and efficient drug could be found within this group, it would go far toward eliminating certain of the well-known practical disadvantages of the usual arseno compounds for, as an arsonic acid, it should form soluble and stable salts and would perhaps offer fewer of the uncertainties in preparation than the trivalent arsenicals.

In the course of these studies a number of substances were prepared which gave interesting experimental results. Those obtained with one in particular, the sodium salt of N-phenylglycineamide-p-arsonic acid, were such as to demand special attention. The simplicity of this compound, the ease with which it can be prepared, its relative cheapness, stability, and solubility, and its favorable biological behavior seem to warrant the publication of a report of the experiments in which it was used. These experiments, which were performed on several types of animals, were of both a chemical therapeutic and a biological nature and the results are given in this article in great detail.

The essential facts to be gathered from the studies of the toxicological action of N-phenylglycineamide-p-arsonic acid may be summarized very briefly. The substance is one which lends itself well to almost any method of administration and can be given to animals in very large doses. The tolerance of different animal species varies rather widely, but with one exception the reaction of laboratory animals

to toxic doses of the drug is of a favorable character. That is, toxic effects are confined to doses relatively close to the minimum lethal dose and the recovery from sublethal intoxication is remarkably rapid and complete.

This important feature of the action of the drug makes possible the repeated administration of even very large doses at comparatively short intervals of time without incurring the dangers incident to cumulative action or superposition of toxic effects. On the other hand, by taking advantage of this fact, it is possible to develop a degree of tolerance such that the dose of the drug administered may be progressively increased to a point well above the dose which is fatal to the normal animal, a feature of the toxicological action of N-phenylglycineamide-p-arsonic acid which is of greatest significance in the use of the drug for therapeutic purpose.

G. E. BEILBY.

Smillie, E. W., Little, R. B., and Florence, L.: An Interpretation of the Agglutination Reaction to Bacillus Abortus in 75 Cases of Bovine Abortion Bacteriologically Controlled. *J. Exper. M.*, xxx, 341.

In this article are given the results of a study of the agglutination test in 75 cases of abortion for which bacteriological data were at hand.

The agglutination test when carried out so as to give the entire range of serum dilutions to the limit of clumping is a delicate test which reflects a variety of conditions involved in infection with bacillus abortus. Among these conditions are the time relation to the act of abortion and the length of time the abortion bacilli live and multiply in the pregnant uterus. It is obvious that if a uterus is infected in the eighth month of pregnancy, the opportunity for agglutinins to accumulate is poorer than if the uterine infection lasts three or four months. In many cases the presence of bacillus abortus in the udder determines the intensity of the reaction. Therefore no definite rules can be formulated for the interpretation of the agglutination reaction quantitatively since it is bound up with a complicated process which varies in different cases. In the individual cow in general a titer of 1:40 or less may be regarded as indicating that the animal is not infected with the bacillus abortus at the time of the blood examination. It does not exclude former infections in the case of older cows, however, nor does it absolutely exclude very recent infection.

The highest titers, 1:640 and above, generally indicate recent infection, and in the absence of recent premature births, infection of the udder. Even when abortion has just occurred, it may have been due to other agencies and the high titer may be maintained by a chronic infection of the udder dating from an earlier uterine infection by bacillus abortus. Intermediate titers may indicate a gradual rise or decline of agglutinins preceding or following abortion without infection of the udder. They may also

stand for a relatively high resistance or partial immunity of the animal.

In any herd a uniformly low titer (1:40 or less) in all animals may be regarded as indicating the entire absence of bacillus abortus. A high titer in any one cow serves to indicate quite definitely the presence of infection in the herd. To determine more accurately the character of the infection in any individual cow a bacteriological study of the milk and of any prematurely discharged calf or foetus is necessary in addition to the quantitative agglutination test.

G. E. BEILBY.

Smith, T., and Taylor, M. S.: Some Morphological and Biological Characters of the Spirilla (*Vibrio foetus*, n. sp.) Associated with Disease of the Foetal Membranes in Cattle. *J. Exper. M.*, 1919, xxx, 299.

In an earlier communication a spirillum of definite morphological and cultural characters was described as being associated in a series of cases with what is commonly known as infectious abortion in cattle. In this article the statements there made concerning the biology of the spirillum are amplified and supplemented by fresh observations and studies on the agglutinative affinities of the various strains. In all, 24 foetal strains have been kept under cultivation. Of these, 1 is a slightly modified, aberrant type. All were obtained from one large herd into which other cattle are introduced at irregular intervals.

In films and in hanging-drop preparations from foetal fluids and cultures therefrom, the spirilla are seen as fine, wavy or sinuous lines of various lengths. The smallest forms appear as minute curved S-shaped lines; the longest may stretch nearly across the field of the microscope. If we assume that the spirillum is in the form of a spiral or corkscrew, the diameter of the spiral is small. The spiral is drawn out, as it were, becoming in some cultures almost a straight line. In dried and strained films the spiral becomes a shallow sinuous line. No segmentations are distinguishable in the longer forms.

As regards size, the width of the spirillum stained in alkaline methylene blue is probably not over 0.2 to 0.3μ , the shortest form about 1.5 to 2μ long. A common size in the foetal fluids consists of about two complete turns and measures 4 to 5μ in length. As stated above, the diameter of the spiral or turn varies somewhat, but it averages about 0.5μ .

The organism stains fairly well in alkaline methylene blue provided the staining is prolonged, preferably over night. It stains much more deeply in diluted aniline water gentian violet, but methylene blue is to be preferred as it requires no decoloration, a process apt to decolorize the spirillum itself.

The article is summarized as follows:

Twenty-two foetal and two calf strains of spirillum have been studied chiefly with regard to the problem of identity. Twenty-one foetal strains are probably specifically the same. One foetal strain differs slightly from these, but in its agglutination affinities

belongs to the same group. Of 2 strains isolated from calves, 1 has definite agglutination relations with the foetal strains, while the other has none. In the morphological and biological characters so far investigated all the strains agree closely with one another.

G. E. BEILBY.

Smith, T.: The Etiological Relation of Spirilla (*Vibrio foetus*) to Bovine Abortion. *J. Exper. M.*, xxx, 313.

Since the summing up of the data contained in a former communication on this subject investigations have been continued upon material from the same herd. From August, 1918, to June, 1919, 12 additional cases of abortion in which spirilla were isolated from foetuses in pure culture have been studied, making 26 in all. In 1 case a slightly divergent strain was obtained, the significance of which cannot be defined. It appeared as a rule in long filaments, although short forms were not lacking. Thus far motility has not been detected. In another paper in which data on the agglutination affinities of the various strains are given, it is shown that this aberrant strain is serologically related to the regular type.

The reader is referred also to an earlier paper on the culture methods employed. Emphasis is placed on the importance of cultures from the digestive tract and the lungs. If the foetus breathes and swallows after expulsion both tracts are apt to be contaminated with miscellaneous bacteria and spirilla will be suppressed in the cultures. Even when the foetus is dead when expelled, these tracts may become contaminated if its mouth and nose lie in water or other fluids. Cultures from the spleen, liver, and kidneys of the foetus by themselves cannot be depended on to bring out the presence of spirilla.

While the author's experimental tests of the pathogenic rôle of vibrio foetus cannot be regarded as final, they give strong evidence as far as they have been carried that it is an etiological factor in bovine abortion. Spiral forms from 4 different cases were inoculated, but only 2 inoculated cases may be considered positive. Whether this negative outcome in the 2 remaining cases was due to a decline or absence of virulence or to varying resistance on the part of the cows must be determined by additional experiments of the same kind.

The article is concluded with the following summary:

The isolation in pure culture of a definite morphological entity (vibrio or spirillum) with practically the same biological characters from a series of cases of the same clinical complex (abortion) establishes a presumption in favor of the specific identity of the organisms and also in favor of the inference that such organisms are etiologically related to the disease condition. This presumption is strengthened by the fact that disease of the foetal membranes followed the injection of pure cultures of this organism in 2 of 4 cases.

G. E. BEILBY.

Smith, T.: The Bacteriology of Bovine Abortion, with Special Reference to Acquired Immunity. *J. Exper. M.*, xxx, 325.

Since the general confirmation of Bang's discovery of a characteristic bacillus, (the bacillus abortus), associated with abortion in cattle and the successful production of disease of the foetal membranes through infection of pregnant cows with bacillus abortus in pure culture, it has been taken for granted that Bang's bacillus is the sole infectious agent and further research regarding the etiology of abortion has given way to a study of methods of diagnosis and of vaccines and their application.

The bacteriological study of cases of abortion as they occurred in a large herd in which a fair proportion of the stock was bred on the spot with accessions from other herds from time to time, which study was continued over a period of two and one-half years, has shown that while bacillus abortus may be the sole agency of abortion in certain herds, this was clearly not true for the herd under investigation.

In view of this somewhat unexpected result it seemed desirable to go over the data pertaining to the various cases in some detail, first, to see how far the bacteriological results could be depended upon to give information concerning the nature of the infectious process leading to the death and expulsion of the foetus, and second, to note the bearing of the bacteriological data on the acquisition of immunity by the cow against later infection.

The investigation is summarized as follows:

In a large herd of dairy cattle and young stock the bacteriological examination of 109 cases of abortion which included a relatively thorough study of the foetus and of the membranes or swabs from the uterus whenever obtainable, gave the following results: 62 (57 per cent) were associated with bacillus abortus; 26 (23.8 per cent) were associated with spirilla; 2 (1.8 per cent) were associated with bacillus pyogenes; and 19 (17.4 per cent) were either sterile or else the digestive and respiratory tracts had been invaded during or after birth with miscellaneous bacteria; bacillus abortus was absent according to cultures and animal tests.

Such a relatively large proportion of cases of abortion without the bacillus abortus as the inciting agent is noteworthy. In general, the bacillus abortus was associated with first pregnancies and its presence diminished rapidly in frequency in later pregnancies.

Assuming in a general way that purchased cows coming from small herds had no immunity and that their first pregnancy in the new herd was equivalent to that of a native heifer and could be counted as the first, it was found that bacillus abortus was associated with the first pregnancy in 42, with the second in 14, with the third in 5, and with the fourth in 1. Spirilla were distributed as follows: (1) in purchased cows, first pregnancy, 6; second pregnancy, 9; third pregnancy, 5; and fourth preg-

nancy, 3; (2) in native cows, first pregnancy, 0; third pregnancy, 1; sixth pregnancy, 1; and eighth pregnancy, 1. The relation of infection with spirilla to acquired immunity is not clear and more data from large herds are needed to define both its etiological and immunological bearings.

Thus far spirilla have not been encountered in native heifers of the herd pregnant for the first time. A tentative explanation to be offered is that the young stock is kept segregated from the older and purchased cows until shortly before calving. The occasional discharge of a foetus among the young stock in pasture tends to keep up the disease due to bacillus abortus. Later on, association with older cows brings about infection with spirilla (vibrio foetus) and more rarely with other possible agencies of foetal disease. On the other hand, abortions may occur among the pastured stock from time to time and remain unrecognized. Not until both groups of animals are subjected to the same daily scrutiny will it be possible to affirm that abortion associated with spirilla does or does not occur among young stock.

G. E. BEILBY.

Murray, J. A.: Cellular Changes in Cartilage Grafts. *Imperial Cancer Research Fund, Report No. 6, 1919, 71.*

The results of the transplantation of hyaline cartilage have frequently been the subject of investigation since the early years of the nineteenth century. The literature of the subject is fully reviewed in Marchand's volume on wound-healing in Billroth and Luecke's "Deutsche Chirurgie." While the transplantation of embryonic cartilage usually leads to the formation of a considerable number of nodules by proliferation of the cartilage cells, most authors are agreed that this does not occur when cartilage from young or adult individuals is used. The pieces acquire a close organic union with their surroundings and persist apparently unaltered for a long time. Grafts of embryonic cartilage, on the contrary, after having attained their maximum size show degenerative changes in cells and matrix and are absorbed.

The density of the matrix of cartilage hinders rapid penetration of most fixing fluids with consequent unequal preservation of superficial and deeper parts. The best results have been obtained by fixing in 10 per cent normal salt solution for at least twenty-four hours. Sections from 10 to 15 μ thick are then cut with the sliding microtome after embedding in Salkind's lead gum, and are transferred to 1 per cent salt solution for from ten minutes to one hour. Slides are prepared beforehand by coating them with a thin layer of 1 per cent gelatine and allowing them to dry. The prepared slides are immersed in the salt solution and the sections arranged in order with a smooth-pointed glass rod. The superfluous fluid is drained off and a wetted cigarette paper carefully lowered over the section. Firm pressure with several layers of filter paper makes the sections adhere to the gelatine and absorbs the excess of moist-

ure. The cigarette paper is then withdrawn and the slide exposed to formalin vapor for a few minutes, after which it is transferred to 10 per cent normal salt solution for five minutes and 5 per cent acetic acid for from ten to twenty minutes, washed in water to remove the lead gum, and strained. The most useful stain for cartilage cells has been found to be Hollande's chlorocarmine followed by Sudan to stain the fat. The sections are mounted in glycerine jelly.

In a mesial longitudinal section of a normal rib cartilage from a young mouse prepared in this way the perichondrium appears as a laminated fibrillar layer in which the flattened nuclei between the fibers show as deeply stained rods. Passing inward the fibrillation gives place to a homogeneous zone of hyaline material containing compressed cells with a finely granular homogeneous protoplasm and flattened nuclei very similar to those in the perichondrium. The transition is gradual and the collagenous fibrils merge without a break into the homogeneous ground substance of the hyaline cartilage. The dense staining reaction of the latter with basic dyes fades at the margin and in hæmatoxylin-van Gieson preparations. For example, there is an almost unstained zone between the pale blue cartilage and the red stained collagen fibrils of the perichondrium.

Grafts are conveniently designated as autologous, homologous, or heterologous, according to whether the donor and recipient are the same individual or separate individuals of the same or different species. The human material placed at the author's disposal consisted of autologous and homologous grafts of varying ages. To assist in the interpretation of the cell changes a series of homologous grafts of mouse-rib cartilages was made. These were examined at intervals of a few days for the first two weeks and thereafter at longer intervals up to six months. Their appearance did not differ appreciably from that of the homologous grafts.

Apart from a pronounced fatty degeneration in the perichondrial cells, no change can be observed in such a graft after two days. The outer layers of the perichondrium apparently degenerate and are replaced by new connective tissue from the host, but in all probability there is a survival and recovery of the inner layer next to the cartilage as in grafts four days old this is found in the same state as in a normal cartilage.

From a consideration of the human and animal cartilage grafts examined the conclusion is drawn that the maintenance of the physical properties of hyaline cartilage after grafting depends on the survival of the cartilage cells. Processes of the same kind as those which occur in undisturbed cartilage, such as senile changes, take place in cartilage grafts and sometimes more rapidly.

There is, therefore, a distinct probability that in cartilage prostheses in man calcification and secondary absorption processes may set in much sooner than might have been expected.

G. E. BEILBY.

Yamagiwa, K., and Ichikawa, K.: An Experimental Study of the Pathogenesis of Epithelial Tumors (Experimentelle Studie ueber die Pathogenese der epithelial Geschwuelste). *Mitt. a. d. med. Fakult. d. k. Univ. zu Tokyo*, 1918, xix, 483.

The authors' experimental study of 3 cases of cancer metastases in lymph nodes demonstrated that experimental carcinoma may be developed from the physiological epithelial cell without specific predisposition to carcinoma merely by continuous irritation.

In the transition of physiological epithelial cells into a carcinoma there are several stages: (1) atypical epithelial proliferation; (2) folliculo-epithelioma; and (3) carcinoma. In its struggle with the connective tissue the folliculo-epithelioma may be conquered and spontaneous recovery may result.

According to these findings, therefore, it is evident that carcinoma is not a carcinoma from the beginning, and also that it may not continue to develop as a carcinoma.

The physiological epithelial cell may be compared to a new-born child whose character, through the influence of education and care, may become good or bad. The physiological epithelial cells may be so influenced that they are changed into carcinoma cells.

Spontaneous recovery occurs not because of a return of the altered metaplastic epithelial cells to their physiological condition, but because these cells are unable to resist the strong re-active growth of the surrounding tissues and therefore atrophy, degenerate, and disappear, the newly formed cicatricial tissue taking their place. W. A. BRENNAN.

ROENTGENOLOGY AND RADIUM THERAPY

Perry, M. W.: Some Effects of Roentgen Rays on Certain Bacteria. *Am. J. Roentgenol.*, 1919, vi, 464.

When preparations of bacillus typhosus and staphylococcus aureus were exposed to roentgen radiation far in excess of the dosage which can be used on man, the bacteria were not killed in any instance.

Nine guinea pigs were injected in the left inguinal region with preparations from the glands of guinea pigs infected with tuberculosis. Two were rayed four days later, before signs of glandular enlargement appeared, and five were rayed after the development of glandular enlargement. Two were kept as controls. The dosage was comparable to the maximum dose used on man. All of the seven which were rayed developed tuberculosis as rapidly as the controls.

In a third experiment twenty-four hour cultures were placed in wide-mouthed cups which were rayed through cotton plugs, the dosage used being more than the full dosage used on man. A part of each culture, unrayed, was retained as a control and both the rayed culture and the control were placed in a

water-bath at 56 degrees centigrade. At definite intervals cultures were removed. From the tabulation of the results it seems that the roentgen rays in dosage comparable to that used on man produced an increased susceptibility to heat.

Perry concludes that:

1. Roentgen rays in the dosage used on man do not prevent the development of bacillus typhosus and staphylococcus aureus in inert media, and twice the dose used on man will not kill cultures of the same bacteria.

2. Roentgen rays in the dosage used on man do not prevent the development of experimental glandular tuberculosis; neither do they destroy the organisms in fully developed glandular tuberculosis.

3. Roentgen rays seem definitely to increase the susceptibility of bacillus typhosus and staphylococcus aureus to heat. Possibly this may indicate a method by which therapeutic results are obtained in the roentgen-ray treatment of bacterial conditions.

D. R. BOWEN.

Handley, W. S.: On the Mode of Spread of Cancer in Relation to Its Treatment by Radiation. *Arch. Radiol. & Electrotherapy*, 1919, xxiv, 137.

The author directs attention to the mode of the spread of cancer in the belief that a knowledge of the process of the dissemination of the disease must form a necessary foundation in planning its radiological as well as its operative treatment. The article is based mainly on a study of breast cancer, although studies of melanotic sarcoma and cancers of mucous glands have led to similar conclusions. The method of spread is called "permeation" which is defined as the continuous tendril-like growth of lines of cancer cells by their own proliferative power along the smaller lymphatic vessels. This process is to be sharply distinguished from infiltration which is the growth of cancer cells through the intercellular spaces. The spreading occurs excentrically in the lymphatics located just above the deep fascia. The microscopic growing edge is to be sharply distinguished from the infiltrating edge of the primary neoplasm where interstitial invasion of the surrounding tissues is taking place. The disappearance of permeated lymphatics in the area between them is due to the destruction after a time of the cancer-permeated lymphatics by the defensive process of "perilymphatic fibrosis."

In view of these facts, when a cancer of the breast is to be treated by radiation either because it is inoperable or operation is contra-indicated, a circular area with a diameter measuring at least from 12 to 16 inches and with its center at the site of the primary growth should be exposed. It is far more important that the process in the microscopic growing edge should be checked than that at the site of the primary growth.

As regards prophylactic radiation after operation, in which the author is a firm believer, the same course is to be followed. Operation may have failed to extirpate a portion of the microscopic growing

edge and microscopic foci may lurk in the supra-clavicular or the anterior mediastinal glands of the same side. In late cases in which the surgeon has found advanced infection of the axilla, the lateral chest wall must receive special attention.

In estimating the value of radiation in cancer, account must be taken of the natural tendency of the disease to undergo local repair. The author had come to the conclusion that every aggregation of cancer cells, after increasing in size for a varying period and for a varying rate, tends spontaneously to undergo certain degenerative or regressive changes. These changes begin at the center of the mass, spread centrifugally to its circumference, and may terminate in the replacement of the mass of cancer cells by a fibrous scar. He believes it quite probable that the degenerate cells which constitute the mass of a carcinoma react readily to radiation. Research is indicated to determine the comparative reaction of the actively growing cancer cell. The ascertaining of this fact may supply the master-key to the therapy of cancer.

To illustrate and confirm the author's contentions, the article contains numerous photomicrographs with comprehensive descriptions.

ADOLPH HARTUNG.

Beck, E. G., and Warner, G. W.: The Intentional Removal of Skin and Other Tissues Overlying Deep-Seated Inoperable Cancer, a Necessity for Effective Treatment with X-Ray or Radium; with Report of Relative Absorption of Rays by Skin, Fat, and Muscle as Compared with Various Thicknesses of Aluminum. *Surg., Gynec. & Obst.*, 1919, xxix, 325.

Emil Beck has worked out a plan whereby it seems probable that hopeless cases of cancer may be treated more effectively with the X-ray and radium.

It is a well-known fact that superficial malignant growths, such as epithelioma, respond readily to X-ray and radium treatment. The reason is very suggestive: the skin, fat, and subcutaneous tissues which usually overlie deep-seated cancer are strong filters of the X-rays; they absorb most of the soft rays from the X-ray tube and allow only the hard rays to penetrate deeply enough to reach the growth. Small quantities of radiation instead of destroying cancer-cell are apt to stimulate it to more rapid growth. Therefore, it seemed to the author that if the skin, all the overlying tissue, and as much of the growth as possible were removed, a large area being left entirely exposed, and if either the X-ray or radium were applied to this field directly, the results obtained in treating deep-seated carcinoma would be similar to those that are usually obtained in the treatment of superficial growths. In other words, the deep-seated growth would be converted into a superficial growth.

To verify the above hypothesis Beck began to use this technique in selected cases. Instead of closing the wound after the completion of the operation for cancer of the breast, he allowed the skin

edges to retract as much as possible in order to leave an opening through which the X-ray and radium might subsequently penetrate directly into the cancer bed and destroy the cancer cells which were inaccessible to surgical removal.

He selected recurrent, apparently inoperable cases of deep-seated carcinoma in which to try out the method. During the past two years he has subjected a series of cases to this form of treatment, four of which are reported in this article. While it is too early to report definite conclusions, the results so far obtained are excellent.

In connection with the report by Beck, G. W. Warner describes a series of experiments which he carried out in order to compare the relative absorption of the skin, fat, and muscles with various thicknesses of aluminum. A hydrogen tube with a tungsten target was used, excitation being produced by a transformer and rotary rectifier. The absorption was measured by an ionization method.

While his data are as yet incomplete, Warner feels safe in stating that a few centimeters of body tissue act effectively as a screen for nearly all the soft rays, but are quite transparent to the hard rays. Hence if it is the soft rays that are valuable in therapeutics, the removal of parts overlying the diseased organ is quite essential, but if benefit is due to the hard rays, the removal of the overlying tissues is unnecessary.

G. W. HOCHREIN.

Knox, R., Radiography of Gall-Stones. *Proc. Roy. Soc. Med., Lond.*, 1919, xii, Sect. Electro-Therap., 76.

Knox contends that in cases of gall-stones radiography is valuable as in many instances it materially aids in the differential diagnosis of lesions on the right side of the abdomen. The variation in the percentages of gall-stones which different workers claim can be shown by roentgenographic examination may be due to a difference in the technique employed and the importance attached to doubtful shadows. It is admitted that a negative roentgenographic report is of no value as all gall-stones cannot be demonstrated. Doubtful shadows are of value in conjunction with clinical signs and symptoms, and encourage research.

Having been skeptical of the value of roentgenography in the diagnosis of gall-stones, the author did some experimental work with calculi, comparing the densities of tissues and making a study of the absorption of radiations and particularly of the photographic processes employed. The investigations were carried out under the following heads: (1) anatomical considerations; (2) pathology of gall-stones—classification; (3) experimental investigation on absorption coefficients of gall-stones and surrounding tissues; (4) radiographic appearance of gall-stones; (5) technique of the examination; (6) situations in which gall-stones may be found; (7) differential diagnosis; (8) the pathological gall-bladder; and (9) case records.

Among the practical points brought out by these

investigations are mentioned the importance of making exposures with the patient lying on his back with his chest elevated. Rays of medium hardness produced the best results. Lateral views occasionally permit differentiation between kidney and gall-stones. The differential diagnosis may be complicated by the appearance of kidney stones, fecal accumulations, or other shadows in the gall-bladder region.

ADOLPH HARTUNG.

Alessandrini, P.: Artificial Pneumoperitoneum in Radiological Diagnosis (*Il pneumo-peritoneo artificiale nella diagnostica radiologica*). *Policlin.*, Roma, 1919, xxvi, sez. prat., 641.

Alessandrini reviews the earlier attempts to render the abdominal viscera amenable to roentgenological examination by introducing air or gas into the abdominal cavity. He refers especially to the technique elaborated by Goetze in 1914. Goetze inflated the abdomen with oxygen in about 90 cases and by this means was able to perceive the outlines of the various organs. The procedure he described as easy and harmless.

Alessandrini has applied Goetze's method in about 40 clinical cases. He does not use the cannulated needle of Goetze, however, as he considers it too large and the traumatism caused by it too severe. There is also the possibility of infection through the large orifice. He therefore prefers common or pneumothorax needles. The patient is placed in a horizontal rather than the semi-seated position recommended by Goetze. The needle is introduced through the left rectus above the umbilicus and below the liver.

Alessandrini uses a modification of the Forlanini pneumothorax apparatus which allows the introduction of the desired quantity of gas at the desired pressure. The quantity of oxygen injected varies from 500 cubic centimeters to 3 liters according to the patient's condition and the abdominal pressure. The gas may be withdrawn immediately after the examination but preferably is permitted to become absorbed which usually occurs in from twenty-four to forty-eight hours, although in some pathologic conditions it may take as long as two or three weeks. Changes in the pulse, respiration, or temperature have never been observed.

In the manner described the author has been able to inflate the peritoneum of patients with hyposystolia, severe meteorism, or intestinal adhesions without any danger. Precaution is necessary only in cases of acute inflammatory conditions of the abdominal organs.

Unless there are diffuse adhesions the introduction of 500 cubic centimeters or more does not notably modify the intra-abdominal pressure.

For the roentgenological examination of the viscera after inflation Alessandrini uses 4 positions as follows:

1. The vertical position, to reveal the diaphragm, the dorsal surface of the liver, the vena cava region, etc.

2. The horizontal position, with the rays directed horizontally to the anterior wall of the abdomen, to reveal the anterior surface of the liver, stomach, colon, kidneys, and spleen.

3. The horizontal position with the rays perpendicular to the flat body surface, for various aspects of the spleen, liver, kidneys, and colon. The pancreas is seen only by chance.

4. The genupectoral position for special observations.

W. A. BRENNAN.

HOSPITAL, MEDICOLEGAL, AND MEDICAL EDUCATION

The Proper Time for Roentgen-Ray Evidence.

Van Tindler vs. Birmingham Railway, Light & Power Co. (Ala.), 80 So. R., p. 858.

In the case of Van Tindler versus the Birmingham Railway, Light, and Power Company, the Supreme Court of Alabama affirmed a judgment in favor of the defendant. The plaintiff urged that a new trial should be granted, claiming that newly discovered evidence obtained from a roentgen-ray examination of her back showed the nature of the injury and its probable cause. The Review Court held that this was not sufficient ground for a new trial because it was not shown by due diligence that this evidence could not have been introduced at the first trial. As one of the plaintiff's contentions was that she had received permanent injury to her spine, it was but fair to herself that she should have obtained and produced the best evidence on the subject, and the reason for resorting to a roentgen-ray examination was just as important before as after the trial.

The value of the roentgen-ray for discovering and diagnosing internal injuries is a matter of common knowledge. The trouble and expense incident to this examination would not have been greater prior to the first trial than after it, and the reasons and necessities for such an examination should be as imperative for the original trial as for the overturning of the verdict of a jury after it has passed on the issue as presented to them.

J. A. CASTAGNINO.

Not Liable for Malpractice of Substitute Physician.

Moore vs. Lee (Texas), 211 S. W. R., p. 214.

In the case of Moore vs. Lee, the Supreme Court of Texas in deciding whether a physician sending another physician to attend a patient in child-

birth, being unable to go himself, would be liable for negligence of the physician sent, stated:

"Giving the most favorable interpretation to defendant-in-error (patient) in determining plaintiff-in-error's responsibility for the alleged negligences and lack of skill of Dr. Hardin, the facts of this record disclose nothing further than an undertaking by plaintiff-in-error to furnish another physician whose work, in the absence of plaintiff-in-error, was necessarily free from his control. . . . If he acted in good faith and with reasonable care in the selection of a physician and surgeon and had no knowledge of the incompetency or lack of skill or want of ability on the part of the person employed, but selected one of good standing in his profession, one authorized under the laws of this State to practice medicine and surgery, he filled the full measure of his contract and cannot be held liable in damages for any want of skill or malpractice on the part of the physician and surgeon employed."

J. A. CASTAGNINO.

Compensation for Medical Service to Wife.

Reahard vs. Miller, Colorado Supreme Court, 179 Pac., p. 157.

In affirming a judgment for \$200 for the plaintiff physician for professional services rendered to the defendant's wife, the Supreme Court of Colorado stated that the plaintiff relied on the liability of the defendant for necessities furnished to the wife. The defendant's contentions were that his wife had left him without cause six months prior to the time the services were performed and that they had lived separately up to the time of her death which occurred shortly after the services were rendered. The evidence, however, showed that the defendant frequently visited his wife; that he stayed many nights at the rooming house where she stayed, a part of the time remaining there every night; that he also visited her at the hospital where she was receiving medical treatment; that he held himself out to others and to the plaintiff as the patient's husband; and that in a conversation relating to the plaintiff's compensation the defendant had stated that he would pay the bill.

The Court in finding the issues for the plaintiff supported the conclusion that there had been no legal separation between the husband and the wife such as would give rise to the inference that the defendant was not liable for the services.

J. A. CASTAGNINO.

GYNECOLOGY

UTERUS

Hendrick, A. C.: On Backward Displacements of the Uterus. *Canadian M. Ass. J.*, 1919, ix, 927.

The problem of backward displacement of the uterus is dealt with under five headings: (1) the usual position in the true pelvis of the normal adult virgin uterus; (2) the anatomical and mechanical reasons for the normal position; (3) the usual causes of displacement; (4) the symptoms; and (5) the treatment.

The position of the uterus is not fixed but is influenced by the bladder and rectum. Normally it is in the true pelvis and there is antelexion and anteversion. The lowest point of the cervix is on a line joining the ischial spines.

The effective supports of the uterus are subperitoneal and derived from the undifferentiated mass of mesenchyma of the genital cord. The fascia is the most important support of the uterus.

The most common cause of displacement is subinvolution. In such cases treatment consists of rest, tonics, douches, the repair of lacerations, and pessary support. If in the case of a woman able to bear children these measures are not successful, an operation to shorten the round ligaments should be performed.

When the fascial supports are also at fault the result will be cystocele with beginning prolapse of the uterus. In such cases, the general health should be built up, the perineum repaired, and the round ligaments shortened. When the patient has passed the menopause a fixation operation may be done.

W. F. HEWITT.

Harris, J. D.: The Treatment of Uterine Fibroids by X-Rays. *Brit. M. J.*, 1919, ii, 376

The value of the X-ray in the treatment of uterine fibroids has been known since 1911, principally through the works of Bordier and Gauss. In cases of intramural fibroids the X-ray is the treatment of choice. It is useful also in the treatment of intra-uterine fibroids and occasionally successful in cases of subperitoneal fibroids.

Gauss advocates drastic methods, using very heavy current, well filtered, over many points of entry, on the abdomen and back, and completing the treatment in one day.

Bordier's method consists of a series of "cycles," each consisting of nine treatments over a period of several days. The cycles are repeated every twenty-one days. After the sixth cycle the symptoms generally disappear. Bordier states that the diagnosis should always be made first and the treatment should be used only for fibromyoma and occasionally hæmorrhagic metritis.

The use of the X-ray is a valuable method of hastening the climacterium and intramural fibromata sometimes cease to cause trouble after the cessation of menstruation. The nearer the patient is to the natural menopause the more successful the treatment. There are no toxic symptoms afterward.

In the case of a young subject with a bleeding myoma operation is the proper course, but there are two contra-indications to this treatment. It should not be used in patients less than 30 to 35 years of age nor for subperitoneal myomata.

The author has previously reported four cases of myoma and in this article reports eighteen others. Twelve of the eighteen patients were discharged cured and none of these has had a return of the trouble. Several of the cures have continued for from three to four years. Two discharged themselves as cured. One had a later hysterectomy after slight improvement, and three were benefited. In suitable cases X-ray treatment should be used in preference to an operation.

B. JAMESON.

Gonin, R.: The Semeiological Value of Curettage in Malignant Disease of the Body of the Uterus (De la valeur sémiologique du curettage dans les affections malignes du corps de l'utérus). *Rev. méd. de la Suisse Rom.*, 1919, xxxix, 421.

The study of two clinical cases has demonstrated to Gonin that the histological study of scrapings from a uterus attacked by carcinoma or sarcoma may be negative as regards neoplastic tissue. He draws the following conclusions:

1. The clinical symptoms of a neoplasm of the uterus in themselves alone give an indication for operation even if the histological examination of a curetted specimen is negative.

2. While exploratory curettage is the method of choice for the diagnosis of tumors of the uterus, in certain cases a uterine neoplasm which is diagnosed clinically may escape the curette. This may occur in cases of malignant epithelial tumors because of their situation and slight protrusion above the surface, and in cases of malignant connective-tissue tumors because of their situation and the fact that in certain stages of their development they involve little or none of the uterine mucosa.

3. The results of an exploratory curettage are the more valuable the more thoroughly and deeply it is done. A deep curettage may bring to light pathologic conditions not reached by a superficial curettage and the tissue obtained will be more suitable for histological examination.

4. Histological evidence of papillomatous lesions in the material obtained by curettage justify the diagnosis of uterine epithelioma. W. A. BRENNAN.

Alter, N. M.: Histological Changes in Squamous-Cell Carcinoma of the Cervix of the Uterus after Radiation. *J. Exper. Research*, 1919, XI, 241.

Carcinoma of the cervix, on account of its accessible location, yields numerous specimens and gives a good opportunity for comparative study. In numerous instances the author obtained a series of specimens from the same case, representing different stages after radiation. For the work of the present paper about 275 specimens were available. The amount of radiation received by the different tissue elements varied greatly on account of the proximity of the application, but the error in this comparative study will not be essential if a standard radiation with variation in the time factor is assumed.

Before any definite histological changes were noticed after the application of radium, there was a latent period, the duration of which could not be determined without experiments. In the early days after the application of radium very intensive eosinophile infiltration made its appearance, considerably exceeding the histo-eosinophilia which sometimes occurs normally in malignant disease. Features of inflammatory reaction dominated the first week after the application of radium, during which time numerous young blood vessels, dilated and engorged, penetrated the parenchyma and separated the epithelial cells. About one week after radiation definite histological changes in the parenchyma cells occurred and remained dominant throughout the entire process.

There was a gradual and proportionate swelling of both the nuclei and the protoplasm, with preservation of the general cell outlines but with a steady increase in all dimensions. The nuclei, which in their former vigorous growth showed great variety of activity, became uniformly pycnotic only to lose their stain-taking capacity in the next stage when their interesting behavior, especially toward iron-haematoxylin, could be observed.

The swollen protoplasm which before showed only a slight affinity to acid dyes and was rather basophilic began more and more to take the acid stain and, with the swelling, turned very strongly acidophile.

While these changes in the stain-taking substance of the protoplasm were going on, vacuoles made their appearance at a very early date and continued to increase steadily, in a certain percentage being very extensive. In an advanced stage of this degeneration only the contours of the cells could be seen, the nuclei lying within them as in a cavity.

The changes described occurred first on the periphery most exposed to the rays of the radium. The deep layers still showed activity, with preservation of the normal outlines and some mitotic figures. The greatly changed cells on the surface layer, however, did not show any mitotic figures or activity and were in a dormant stage. Depending on the treatment they either returned to normal activity or the degeneration proceeded through the entire tissue.

In cases of continued radiation, mitotic figures were not found anywhere. This change occurred about the second week after the beginning of the radium treatment or much later, depending again mainly on the technique. After the second week the epithelial cells were not arranged in nests, but were intermingled with the connective tissue. From the third week the histological picture was characterized principally by the very marked changes in the chromatin substance. Up to this time the nuclei preserved their shape, and only careful nuclear staining revealed changes in structure. In the course of the fourth and fifth week the nuclei and protoplasm entered the stage of definite destruction. The swollen and very irregular nuclei broke up and dispersed in the protoplasm which in many instances preserved its outlines. In some instances the chromatin substance formed irregular globs and diffuse meshwork with occasional vacuoles filling the entire protoplasm which in other showed loss of outlines and gradual transition into the surrounding homogeneous pink (eosinophile) substance which formed a hyalin-like matrix.

About nine weeks after the application of a strong radiation groups of peculiar bodies, stained very deeply with nuclear stains and representing large irregular chromatin masses, were seen scattered in young connective tissue.

An entirely different and very interesting process took place on the surface; as the final products of the destruction two substances could be distinguished. These are described as follows:

First, as a result of the dissolution of the cytoplasm, a pink-stained homogeneous substance was found, which, by its morphological appearance, reminded the author of hyalin material without any structure and was identical with the eosinophile substance of the deeper tissue, but distinctly not necrotic in character and mostly free from any other substance, especially nuclear substance.

Second, the nuclear substance was represented in places by irregular masses of blue-stained material, often globules or just cloudy masses, and at others by only nuclear dust, but in every case formed a definite layer covering the hyalin substance from which it was quite distinct. The hyalin-like substance underwent organization from beneath, whence fibroblasts and young capillaries proliferated vigorously toward the surface.

Like Ribbert, Hansemann, Hauser, Lubarsch, and others, Alter attributes primary importance in the etiology of carcinoma to the proliferation of the connective tissue following inflammatory changes. Even assuming the shortcomings of histological technique in detecting the mitotic figures of the connective tissue, he states that they could not elude the rays of radium to which they succumb and consequently cease their activity. Connective tissue, however, was increased in amount during the histological changes described, taking the place of the malignant parenchyma and being

formed mostly from wandering cells. When it had fulfilled its purpose it degenerated.

From his study Alter draws the following conclusions:

The so-called "squamous-cell" carcinoma of the cervix is a basal-cell growth of three types: solid, adenoid, and cystic.

The primary effect of the rays of radium upon basal-cell carcinoma of the cervix is the destruction of the cells of the malignant parenchyma.

The increase of stroma is secondary following the disappearance of the parenchyma, and is due mostly to wandering cells. Cell divisions, even if probable, are not primarily important.

In a long series of histological observations, the chromatin substance of the parenchyma cells invariably was very sensitive to the rays of radium, showing conspicuous signs of destruction.

The protoplasm of the parenchyma cells showed marked but not as obvious changes.

The changes in the protoplasm and the nature of the infiltration seem to suggest different stages of deep-seated chemical changes due to the action of the rays of radium.

G. E. BEILBY.

Langstroth, F. W.: Plastic Conical Enuclation of the Cervix; Surgical Indications and Clinical Results in 75 Cases. *J. M. Soc. N. Jersey*, 1919, xvi, 135.

Numerous authorities are quoted to prove that the cervix is more frequently the site of bacterial infection than the mucosa of the fundus. This accounts for the greater frequency of cancer of the cervix as compared with cancer of the fundus.

Langstroth believes that his plastic conical enucleation of the cervix offers the only cure for chronic leucorrhœa without anatomical damage of the uterus. In 75 cases which he operated upon in this way the leucorrhœa was cured, the menstrual cycle was re-established, the pelvic masses were reduced in size or entirely obliterated, the backache and pelvic pain disappeared, and the patient's general health was improved.

M. J. GELPI.

Gellhorn, G.: Secondary Syphilis of the Uterus. *Surg., Gynec. & Obst.*, 1919, xxix, 374.

The patient in the case reported was a woman, aged 26 years, who had no clinical signs of syphilis upon her body, but gave a positive Wasserman test. Pelvic examination showed the scar of a healed primary lesion on the left labium minus and there was an old laceration of the cervix with some eversion of the cervical lips. On the endometrium of the cervix were four typical secondary syphilitic ulcerations in the discharge from which the spirochætæ were found. These ulcers persisted at the end of one month in spite of energetic treatment with salvarsan, mercury, and potassium iodide.

Secondary syphilis of the cervix occurs in the form of macules, papules, or ulcerations which probably represent three successive stages in the development of the same lesion. In all previously reported cases

the lesion was situated upon the outside of the vaginal portion. This is the first known case in which the specific affection could be demonstrated within the cervical canal.

The author and other observers had found the spirochætæ in apparently normal cervical secretions and had concluded that the normal secretions of syphilitic women may cause infection even in the absence of local specific manifestations. The present case apparently explains the former findings. Until further evidence to the contrary is obtained, it will be safe to adhere to the old view that discharges contain infectious spirochætæ only in the presence of a local lesion.

S. A. CHALFANT.

ADNEXAL AND PERI-UTERINE CONDITIONS

Windeyer, J. C.: The Treatment of Salpingitis. *Med. J. Australia*, 1919, ii, 235.

Windeyer reports 500 consecutive gynecological operations 114 of which were for salpingitis. He emphasizes the need for rest in acute salpingitis and states that the condition is usually more disabling than dangerous as rupture of a tubo-ovarian abscess into the peritoneal cavity is rare.

Active treatment should be expectant unless palpable foci of pus are apparent, in which case drainage should be obtained through the posterior fornix. The patient should then rest in bed for at least two weeks after the disappearance of pain and fever, this rest being followed by a month's convalescence before any work is attempted. During the early stages hot douches, tampons, and stupes are of value. Coal-tar preparations or morphine may be given for the pain. Similar treatment is indicated in the resolving stage of the condition and fresh air is very important.

The time for operation is a few weeks to six months after an acute attack or exacerbation. While usually the complete removal of both tubes is necessary, one or both ovaries may be saved. Curettage of the uterus is contra-indicated as by this procedure the infection is spread.

In conclusion the author states that if rest were more generally insisted upon in the acute and subacute stages, there would be far fewer mutilating pelvic operations for in many cases so treated all symptoms disappear after six months.

W. F. HEWITT.

Gordon, A. K.: Two Cases of Hypernephroma of the Ovary. *British M. J.*, 1919, ii, 495.

In a recent series of 1,000 consecutive morbid growths sent to the author for examination he found 2 cases of hypernephroma of the ovary, a neoplasm which is sufficiently rare to justify a brief descriptive note. In both instances the tumor was detected in the left ovary in the course of hysterectomy for fibroids and intractable menorrhagia respectively. The right ovary showed nothing abnormal to the naked eye. As the appearances, both macroscopic and microscopic, were practically

the same in each case, one description will serve for the two.

Each tumor was oval in shape, about 1 inch long by $\frac{1}{2}$ inch across, and was embedded in the stroma of the oöphoron proper, its free border projecting into the peritoneal cavity. There was no definite capsule, but in sections the distinction between the white substance of the tumor and its vascular ovarian bed—from which it could easily be shelled out—was well marked.

Serial paraffin sections were cut and stained, some with iron hæmatoxylin and Biebrich scarlet, and others with acid rubin and Mallory's aniline blue and orange stain; the latter method, however, yielded no additional information.

Macroscopically the ovarian stroma showed no abnormality, and the tumor was seen to consist of a homogeneous mass of cells the nuclei of which stained faintly with hæmatoxylin, while the cell substance did not take the counter stain at all. The cells were identical in appearance with those of the normal suprarenal cortex. The nuclei were not in mitosis and there was no evidence of conjunction between those of adjoining cells.

The origin of these hypernephromata would seem to be sufficiently clear from a consideration of the embryology of the parts. Until the third month of foetal life the suprarenal bodies are in contact with the upper pole of the testis or ovary, and as this descends it may carry with it fragments of suprarenal tissue from which tumors may subsequently be developed. As a matter of fact, however, hypernephromata are more frequently found in the broad ligament than in the oöphoron itself.

There was no clinical or microscopic evidence of malignancy in either of these cases.

EXTERNAL GENITALIA

Bérard, L., and Dunet, C.: Kraurosis of the Vulva (Kraurosis de la vulve). *Ann. de gynéc. et d'obst.*, 1919, lxxii, 449.

The authors report 2 cases of kraurosis of the vulva in women aged 61 and 64 years. These were cases of the kraurosis leukoplakia of Breisly and the inflammatory kraurosis of Lawson-Tait with epitheliomatous degeneration.

From a study of the condition the authors find that the primary causes are ovarian insufficiency and infections, but that neither of these factors alone is sufficient to explain the pathogenesis of the condition, the coexistence of both being necessary. The exact part played by syphilis, tuberculosis, and chronic intoxication as etiological factors is not known and details are lacking in the case reports published.

One of the complications of kraurosis is epitheliomatous degeneration. In 67 cases reported by Trespe there were 6 cases of cancer, about 10 per cent. The authors' second case proves that this degeneration occurs also in cases of inflammatory kraurosis. This fact is evident on histological examination and demonstrates the necessity for active therapeutics. Inflammatory plaques should be destroyed by cauterization, or still better, should be removed surgically with excision of all suspected tissues.

Whatever the variety of kraurosis, a subsequent cancerous complication is possible and operation is therefore the only treatment which gives satisfactory results. In both of the authors' cases, a vulvectomy was done and recovery was uneventful.

W. A. BRENNAN.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Anderodias, J.: Prolapse of the Gravid Uterus (le prolapsus de l'utérus gravide). *J. de méd. de Bordeaux*, 1919, XC, 327.

Anderodias gives the history of a para-iii who entered a maternity hospital in the eighth month of pregnancy with prolapse of the uterus such that the uterine cervix was almost outside the vulva. The cervix was considerably elongated, the intravaginal portion measuring 8 or 10 centimeters.

Uterine prolapse during pregnancy, especially with protrusion of the entire cervix, is extremely rare. Records covering twenty years and including approximately 1,500 labors show only 5 similar cases.

In the case reported the prolapse occurred immediately after the patient's first labor and was due probably to a violent effort favored by changes in the uterine ligaments and especially by a perineal tear. When she was 27 years old an operation was performed for the condition but had not afforded much relief. The organ remained almost constantly outside the vulva and laterally was in contact with the thighs. The second labor had taken place with the cervix in this position.

While ordinarily in rising in the abdomen the gravid uterus draws the cervix up with it, in this instance the cervix did not follow because of its abnormal length.

When pregnancy is once established in a prolapsed uterus, it is apt to go on to term. In the patient's two previous labors the child was presented by the breech, and the author believes that the present pregnancy will end similarly and spontaneously at term.

The precautions to be taken in this case during and after labor must be directed especially against infection arising from cervical ulceration and endometritis from external septic conditions.

W. A. BRENNAN.

Smith, F. J.: The Prophylactic and Symptomatic Treatment in Eclampsia. *J. Iowa M. Soc.*, 1919, ix, 268.

Smith reports nine cases of eclampsia and discusses the etiology and symptomatic treatment. He emphasizes the fact that in the nephritic type of eclampsia increased blood pressure is an early symptom antedating albuminuria, while in the hepatic type there is usually an absence of urinary findings. He concludes that if a toxin is the cause of eclampsia, it is not necessarily a special toxin, but possibly an accumulation in the tissues of the ordinary toxic products of metabolism.

In the pre-eclamptic state there is a failure on the

part of the organism to eliminate the excess toxic products. This failure may be due to one or both of the following causes:

1. Chronic nephritis. In this type there may be a recurrence of eclamptic symptoms with each pregnancy.

2. An insufficient margin of elimination in either normal or diseased kidneys. If the kidneys are normal, we may or may not expect a recurrence of eclamptic symptoms in succeeding pregnancies, depending chiefly on the use or non-use of prophylactic treatment. In this form prophylactic treatment gives the most brilliant results.

Prophylaxis consists of overcoming the deficient elimination through the kidneys by inducing copious perspiration. This is best accomplished by the intelligent use of the hot pack combined with the administration of tincture of digitalis.

When symptomatic treatment is indicated, veratrum viride should be borne in mind. When medicinal treatment fails, operative treatment will also probably fail.

W. F. HEWITT.

Patel and Dujol: Pyosalpinx and Colon-Bacillus Pelvipéritonitis during Pregnancy (Pyosalpinx et pelvi-péritonite à coli-bacilles pendant la grossesse). *Presse méd.*, Par., 1919, xxvii, 479.

The colon bacillus is the agent most commonly found in the pathology of pregnancy. It may manifest its presence by a more or less attenuated septicæmia or become localized in a particular organ such as the kidney or bladder.

The authors give the clinical details of a colon-bacillus infection of the genital organs in a woman about two months pregnant. In their opinion the infecting agents came from the intestine by the descending route. There were no antecedent genital lesions to account for the onset which was sudden and definite. Constipation which increased the virulence of the intestinal bacteria seems to have been an important factor. The bacteria infiltrating through the intestinal walls infected the tubes and then the uterine mucosa, causing the death of the foetus. A right pyosalpinx and an extensive collection of pus in the pouch of Douglas were found at operation. The uterus was removed.

In spite of the frequency of constipation during pregnancy, such infections are uncommon before the birth of the child.

The authors discuss the bacterial invasion of the uterus from above downward and quote various authorities to prove the possibility of this mechanism of infection.

Usually the condition is not correctly diagnosed, its origin being ascribed to the appendix, gall-bladder, or kidney, and even if a colon-bacillus infection is

suspected its localization is not apt to be. Hæmo-cultures, however, may give a clue.

In all other cases similar to their own which the authors have been able to find in the literature there was an early abortion. A few patients recovered after operation. In some cases spontaneous abortion results in a cure, but if there are signs of peritoneal abscess an operation is indicated. The intervention should be for the evacuation of pus and to institute drainage. The advisability of removing the uterus depends upon the conditions in the particular case.

W. A. BRENNAN.

Grosse, A.: A Double Ovariectomy for Bilateral Ovarian Cysts at the End of the Fourth Month of Pregnancy (Ovariectomie double pour kystes ovariens bilatéraux à la fin du quatrième mois de la grossesse). *Ann. de gynec. et d'obst.*, 1919, xliii, 464.

The patient in Grosse's case was 34 years old, the mother of 2 children, both born at term. In the fourth month of her third pregnancy examination and the history led to the diagnosis of bilateral ovarian cysts with torsion of the cyst on the left side.

On opening the abdomen the left ovary was found discolored and adherent to the neighboring viscera and the abdominal wall, but was easily freed, ligated, and removed. The gravid uterus was then swung to one side and the cyst of the right ovary removed.

The cyst from the left ovary contained 800 grams of blood while that of the right was the size of a large orange and contained thick mucous fluid. Near its point of origin were found remnants of ovarian tissue with a corpus luteum of pregnancy.

The patient made an uneventful recovery. The pregnancy continued normally to term, but there was some hydramnios. The labor was slow and the use of forceps was necessary. The placenta was normal. The child weighed 3,650 grams.

It has been shown by Fraenkel and many others that the corpus luteum exerts an important influence on gestation by its internal secretion. Not only does it have an effect on the nutrition of the uterus which is prepared to receive the fecundated ovum, but it is indispensable in the embedding of the ovum in the uterine cavity and in its development during the first half of pregnancy. In experiments on animals its removal during this period stopped pregnancy. Apparently, however, this is not true in the human subject as cases are on record in which a double ovariectomy or the removal of one ovary containing a corpus luteum did not hinder the evolution of a pregnancy which had already begun. In 51 cases reported in the literature in which a double ovariectomy was performed the pregnancy was interrupted in only 7. It therefore appears that the corpus luteum of pregnancy in woman is not at all indispensable to the development of the ovum in the early part of gestation and its removal does not necessarily mean abortion.

W. A. BRENNAN.

Hardouin: Unitubular Extra-Uterine Twin Pregnancies (Grossesses extra-utérines gémeillaires unitubaires). *Arch. mens. d'obst. et de gynec.*, 1919, vii, 351.

Twin ectopic pregnancies may be classified in two groups: (1) those in which each tube contains an embryo, i.e., bilateral extra-uterine twin pregnancy; and (2) those in which the two fetuses are in the same tube, i.e., monotubal extra-uterine twin pregnancy. Of the first variety only about 15 authentic cases have been reported in the literature. Of the second variety Pool and Robbins collected 27 authentic cases in 1910.

Counting a case of his own, that of a woman 40 years of age, a ii-para, the author increases the number of authentic cases in the literature to 36 of which he gives short histories. Included in this total are only cases in which the fecundation of both ova was simultaneous.

From a perusal of the case histories it seems evident that the etiology is much the same as that of simple ectopic pregnancy. Most of the women were multiparæ who had had miscarriages or whose last pregnancy had occurred a long time previous and whose first child was born after they had been married a long while.

The left tube was more frequently involved than the right. In 24 cases in which the fact is stated the left tube was involved in 16 and the right in 8. Rupture usually occurred between the sixth and eighth week. Generally the two ova were together in the same dilatation of the tube and only in 2 instances were they separate in distinct dilatations.

In 3 of the cases there were more than two fetuses in the tube. In 2 cases there were 3 fetuses, and in 1 case, 5.

In 3 cases there were twin pregnancies in one tube and at the same time another fetus in the opposite tube. The 3 appeared to be of the same age.

The symptoms of twin extra-uterine pregnancy cannot be distinguished from those of ordinary extra-uterine pregnancy.

The diagnosis of twin extra-uterine pregnancy has never been made before operation.

The operative results recorded appear to have been good as there were only 2 deaths. It is possible, however, that cases in which the results were unfavorable were not reported. The author's patient made a good recovery.

W. A. BRENNAN.

Gilliatt, W.: Two Cases of Full-Term Extra-Uterine Gestation. *Proc. Roy. Soc. Med.*, Lond., 1919, xii, Sect. Obst. & Gynec., 177.

Case 1. The patient had had five children, the last one eighteen years previously. Forceps were used at the first labor but the others were normal. After a fall twenty-eight years previously the patient noticed a tumor on the left side. Five months before admittance to the hospital an abscess formed. Six weeks later this ruptured $2\frac{1}{2}$ inches above the umbilicus and continued to drain pure streptococcal pus. Examination revealed an

irregular pelvic tumor, cystic below and hard above. Pressure from below caused a discharge of pus. The mass in front of the vagina moved with the uterus and was $2\frac{1}{2}$ inches deep. Laparotomy revealed a sac on the left side of the uterus containing foetal remains. The abscess cavity was in the lower part of the sac.

Case 2. Only a partial history was obtainable in this case. Four years previously the patient believed herself pregnant but the child was not born. Medical opinion differed, but the final decision was that there was no pregnancy. When admitted to the hospital where she was seen by the author, the patient had been in labor for seven hours. Examination disclosed a full-term uterine pregnancy with the uterus lying more than normally to the right due to a tense swelling impacted in the left iliac fossa. The child presented by the breech. The cervix was high and the membranes were unruptured and bulging. On the left side was a fixed abdominal mass diagnosed as an ovarian tumor obstructing labor. A living child was delivered by caesarian section. The mass proved to be a sac containing a small eight-months' foetus. M. J. GELPI.

Vaudescal, R.: Interstitial Pregnancy (De la grossesse interstitielle). *Arch. mens. d'obst. et de gynéc.*, 1919, viii, 177.

The author has observed three cases of interstitial pregnancy and has made a detailed study of them in order to test the points classically considered characteristic of this abnormal condition, i.e., the sign of Ruge-Simon, asymmetry of the adnexa, and lateral insertion of the round ligament.

The first case was an interstitial pregnancy which had passed the fourth month without rupture and in which the placenta had remained and developed in the primary implantation cavity. The second case was an arrested early pregnancy in the interstitial portion of the right tube. The third case was a ruptured interstitial pregnancy on the left side.

A total or partial hysterectomy with ablation of the adnexa was done in all three cases and the specimens were examined macroscopically and microscopically.

With regard to the Ruge-Simon sign (straightening of the uterine fundus) the author states that although it is undoubtedly present in the majority of cases, it cannot be considered such a valuable criterion that its absence demonstrates definitely that the pregnancy is not interstitial. Neither is the asymmetric insertion of the adnexa necessarily an essential finding in an interstitial pregnancy, for it may be present in a cornual pregnancy or a pregnancy in a bipartate uterus.

While the three signs mentioned are very apt to be present in an interstitial pregnancy, none of them is essential, though the presence of all or of any one of them should suggest an interstitial pregnancy. The examination of the patient, especially in the early stages of such a pregnancy,

does not permit an exact diagnosis and in none of the cases examined by the author was a diagnosis made before operation.

In the microscopic study of the uterine mucosa in the author's three cases he was not able to discover any evidence that a uterine decidua is formed in the course of ectopic pregnancy. W. A. BRENNAN.

Essen-Moeller, E.: The Results and Indications of Abdominal Caesarean Section. (Sur les résultats et les indications de l'opération césarienne abdominale). *Arch. mens. d'obst. et de gynéc.*, 1919, viii, 221.

The author reports 106 abdominal caesarean operations performed in the university clinic of Lund. The indication for the operation was disproportion between the pelvic opening and the foetal head in 74; eclampsia in 10; placenta prævia in 7; and obstructing myomata in 8.

There were 6 deaths, 3 being those of patients with eclampsia. In cases of eclampsia, accidental hæmorrhage, and placenta prævia 9 of the children died, 7 being dead before operation. The mortality was therefore 5.6 per cent among the mothers and 1.02 per cent among the children.

The author's experience in 10 abdominal caesarean sections performed because of eclampsia has led him to the conclusion that in these cases the vaginal caesarean section is better than the abdominal, and the abdominal should be performed only when the vaginal operation would be too difficult.

In cases of placenta prævia the author performs the abdominal caesarean section only when the hæmorrhage is severe, the cervix is not sufficiently dilated to permit version, and it is certain that the mother is not infected.

In 74 abdominal caesarean operations for contracted pelvis there was only 1 death, and in this case the woman was infected. In the author's opinion, caesarean section is much better than version in such cases.

In conclusion it is stated that if the contractions of the uterus cannot overcome the pelvic narrowness it is better to resort to an abdominal caesarean section than to the use of the forceps, version, or craniotomy whenever the mother is not infected. If there is the least suspicion of infection, the author attempts version or tries the forceps to avoid if possible a craniotomy on a living child. It is only when there is no chance that the mother will subsequently have a living child, or when such a measure is absolutely indicated, that the author does a Porro caesarean even in suspicious cases. Eight of his 106 operations were of the Porro type and all of the patients recovered. W. A. BRENNAN.

Delle Chiaje, S.: Repeated Caesarean Sections on the Same Woman (Sul taglio cesares ripetuto nella stessa donna). *Riforma med.*, 1919, xxxv, 760.

The author reports four cases in which he did a repeated caesarean section. The adhesions were such as to offer an obstacle to the regular method of

operation. He was enabled to bring the uterus to the surface, however, without recourse to special technique in all cases except one.

The rules to be followed according to Delle Chiaje are summarized as follows:

1. The operation should be performed at term before the onset of labor.

2. To bring the uterus to the surface from the abdominal cavity incise it in the upper part of the anterior wall, including also the fundus. The foetal sac should be opened in the second stage of the operation.

3. In tamponing the cavity begin at the lower segment.

4. Suture the uterus in two planes, the first with silk, the second with catgut.

5. The advisability of sterilizing the patient depends entirely upon the condition of the internal genitalia. It is accomplished by resecting 1 centimeter of the tubes at their insertion.

W. A. BRENNAN.

LABOR AND ITS COMPLICATIONS

Winch, G. H.: Twilight Sleep in General Practice.
Lancet, 1919, cxcvii, 563.

The author reviews the technique and results of the use of twilight sleep in a series of 435 cases in private practice. These cases covered a period of five years and nine months and many of them were followed up. More than one-third of the patients were primiparæ. There were 422 normal vertex presentations, 8 breech, 2 face, and 3 transverse presentations. The only absolute contra-indication to the use of twilight sleep is primary uterine inertia. Contracted pelvis, dry labor, rigid cervix, eclampsia, and heart disease are not contra-indications. The object is to obtain both analgesia and amnesia. The latter condition saves physical and mental suffering but does not cause loss of memory.

The technique employed was that of Gauss of Freiburg. According to this technique the patient is placed at the beginning of labor in the room selected for delivery. As soon as there is two fingers' dilatation, the room is darkened and the ears are plugged with cotton. Morphine hydrochloride, $\frac{1}{4}$ grain, and scopolamine hydrobromide, $\frac{1}{150}$ grain, are then given hypodermically. Foetal heart tones are noted closely and at the end of one hour the second injection is given. This and all succeeding injections consist of $\frac{1}{450}$ grain of scopolamine hydrobromide. The memory test serves as an index to the later injections. During the anæsthesia dryness of the lips and throat make frequent sips of water necessary. The bladder must be emptied with the catheter.

In the cases reported the first stage was definitely shortened while the second stage was lengthened even to five or six hours, the greatest delay being when the head reached the perineum. Many of the labors were terminated at this stage by the use of the forceps or the administration of pituitrin. In the cases

of twilight sleep less chloroform was required and pituitrin had less effect than in those in which twilight sleep was not used.

After delivery the cord was tied and the child removed to another room. In 11.9 per cent of the cases cyanosis was present, but if left alone, a return to normal occurred after considerable time. In the third stage postpartum hæmorrhage occurred in 3.3 per cent of the cases. In 2 of these the bleeding was due to an adherent placenta, and in another to manipulation during version. Perineal tears were remarkably few. In the puerperium the mother usually slept from two to six hours. There was little evidence of shock. Lactation and involution proceeded quite as normally as when twilight sleep was not induced.

In conclusion the author presents a table of the 435 cases in which there was no foetal or maternal mortality. The average duration of labor for primiparæ was eighteen and one-half hours; for multiparæ, eight and three-fourths hours. The largest number of injections was 14.

Twilight sleep administered in strict accordance with the Gauss technique is of great value in obstetrical practice. There are no ill effects to either the mother or the child. The main disadvantage is the time required to attend the case. The method can be used as safely in the home as in the hospital. A case history is given illustrative of the average case. Emphasis is placed upon the importance of proper amnesia during the entire labor.

J. M. ROWLEY.

Reed, C. B.: Breech Presentation—Management.
Surg. Clin. Chicago, 1919, iii, 1045.

The author presents two cases of breech presentation with their management. The first patient had nephritis and was threatened with eclampsia. Labor was induced by the introduction of a Voorhees bag. The description of the technique of extraction emphasizes the importance of maintaining a correct position of the operator's hands while the arms of the baby are being delivered.

The second patient had a flat pelvis. The position of the child was sacro-right posterior and its size above the normal safe average. The technique and advantages of pubiotomy and episiotomy which were done in this case are fully discussed. It is stated that pubiotomy is the operation of choice when in cases of disproportion between the size of the foetal head and the pelvic measurements of the mother, it becomes necessary to extract the child by the breech or with forceps.

C. D. HAUCH.

Kickham, C. J.: Notes on the Use of Obstetrical Forceps. *Boston M. & S. J.*, 1919, clxxxi, 534.

In the use of the obstetrical forceps it is essential that a correct diagnosis be made of the presenting part. The forceps should not be applied until the first stage of labor is completed, either normally or artificially, and in all cases an anæsthetic should be used. In applying the forceps the obstetrician

should insert the whole or at least half of his hand into the vagina. The technique preceding the application of the forceps should also be scrupulously carried out.

The application of the reverse forceps should never be undertaken by one who is not an expert. In the use of the reverse forceps the author favors the double application or Scanzoni method.

It must be borne in mind that the axes of the pelvic inlet and outlet are on different planes and the birth canal is crescentic in shape. However often it may be necessary to apply the forceps, an examination should be made each time to ascertain the exact position of the presenting part.

The forceps should never be applied hastily and all manipulations must be very gentle. The traction should be intermittent and the expulsive action of the uterus stimulated.

The time required to make a proper diagnosis of the presenting part when a difficult application of the forceps is necessary will give good results and lessen the danger. N. W. VAUX.

White, C.: A Fœtus Undergoing Spontaneous Evolution Removed by Laparotomy during Labor. *Proc. Roy. Soc. Med.*, Lond., 1919, xii, Sect. Obst. & Gynec., 135.

The patient had had four normal labors. Seven hours after the beginning of her fifth labor the membranes were ruptured. The second day the pains ceased; on the third day they began again. The left shoulder presented but version could not be performed under anæsthesia.

The pain was constant, there were tonic contractions of the uterus and an offensive discharge, and the patient's general condition was poor. The cord and both arms and the right leg of the child were prolapsed into the vagina. The cord was not pulsating. The lower uterine segment was tense and thinned.

The child's arms were amputated and a 7-lb. weight was attached to the foot for three-quarters of an hour. This being unsuccessful, a laparotomy was performed seventy hours after labor began and a hysterectomy performed. During the extirpation the uterus slowly ruptured at the lower segment.

The specimen showed a distorted fœtus of the usual size of a full-term child. The compression had been so great that where the foetal parts were in contact with each other were depressions, and two grooves had been formed on the outer surface by the uterine action. According to the author, this specimen showed the condition of the fœtus during spontaneous evolution. M. J. GELPI.

Ballard, P.: The Persistence of Life in the Child in Cases of Prolapse of the Cord without Pulsations (Sur la persistance de la vie de l'enfant dans des cas de cordon procident dépourvu de battements). *Arch. mens. d'obst. et de gynéc.*, 1919, viii, 245.

The prolonged absence of pulsations in cases of prolapse of the cord is generally considered a sign indi-

cating the death of the fœtus. Occasionally, however, this is not true. The author quotes short histories of several cases from the literature in which a living child was delivered despite the absence of pulsations in a prolapsed cord. More accurate and definite information regarding the condition of the fœtus can be obtained by Pachon's oscillometric method. The conclusions reached by Ballard from a study of the subject are:

1. The absence of pulsations in a prolapsed cord does not necessarily imply that the fœtus is dead. The examination should always be controlled by auscultation.

2. The fœtus may be alive, however, even when auscultation is negative.

3. The absence of pulsations does not necessarily indicate an interruption of the foetal circulation. It may be due simply to a moderate compression which decreases the caliber of the vessels sufficiently to suppress the pulsatile wave.

4. The elements of this mechanism are apparent from the relationship in normal labor of the uterine contraction during the period of dilatation and the arterial tension in the fœtus.

5. Whenever there is the least doubt regarding the death of the fœtus the obstetrician should refrain from performing a mutilating operation unless the condition of the mother imperiously demands it.

6. In all cases of prolapse of the cord in which pulsations are perceptible the cord should be put back if possible during the period of dilatation, and during the expulsive period the child should be delivered with forceps unless a very rapid spontaneous expulsion is anticipated. W. A. BRENNAN.

MISCELLANEOUS

Phillips, J.: Maternal Mortality in Childbed. *Lancet*, 1919, cxcvii, 275.

The writer presents the question, "Can maternal mortality in child birth be further reduced?" and reviews thirty-five years of midwifery in private practice, including some 2,100 cases with 7 maternal fatalities.

A brief discussion of the advances tending to reduce septic mortality and morbidity is given with the conclusion that no antiseptic is safer than the spirit solution of 1 in 1000 hydrarg. biniodide. The care of the mother in pregnancy and the puerperium is reviewed, and attention is drawn to the possibility of infection of the bladder, bile ducts, and kidneys by the bacillus coli. Pelvic examinations, mensuration, and careful examination of the excreta are advocated. The writer examines the pelvis internally during the lying-in period at the end of a fortnight and again at the end of three weeks when the patient rises from her bed.

Abstracts of the 7 maternal deaths are presented.

CASE 1. The patient, who was attended in the early "eighties," had given a history during a previous labor of what now would be readily diagnosed as

appendicitis. This subsided and she remained quite well until a few days before the onset of the labor reported. She then had several severe attacks of acute pain in the lower iliac fossa in one of which labor came on prematurely. Death occurred from acute peritonitis. The child was born alive.

CASE 2. This case is of interest because its outcome was similar to that of many cases in the influenza epidemic of 1918. The patient, eight and one-half months pregnant, was suddenly seized with chills and the symptoms of influenza which at that time was called "Russian influenza." A large amount of liquor amnii necessitated premature rupture of the membranes for the relief of dyspnoea. Labor came on rapidly with the delivery of a living child. The mother succumbed to pneumonia twenty-four hours later.

CASE 3. The third death was due to placenta prævia which was fatal also to the child. As two hæmorrhages contra-indicated cæsarean section, pelvic delivery was done.

CASE 4. Concealed accidental hæmorrhage complicated by pericarditis with aortic stenosis was fatal to both mother and child; the immediate cause of death was believed to be "shock."

CASE 5. Hepatic toxæmia associated with labor prematurely induced because of pelvic contraction caused the death of the mother and child. Vomiting, jaundice, and a temperature of 110 degrees were terminal symptoms. Pathologic examination gave rise to conflicting opinions as to the exact condition but the author believed it to be acute yellow atrophy of the liver.

CASE 6. This was a case of transverse presentation in a woman who had had an anterior fixation of the uterus in which the sutures were passed through the fundus. Labor was induced in the thirty-eighth week after it was decided that cæsarean section was impracticable. The immediate cause of death was believed to be reflex cardiac inhibition from peritoneal traction. The child lived.

CASE 7. Secondary postpartum hæmorrhage following a sudden nervous shock caused the death of a very nervous and apprehensive patient.

The 7 deaths among the 2,100 patients attended by the author give a mortality of 0.3 per cent. The corresponding figures of various hospitals range between 0.18 and 0.6 per cent. The author discusses the methods of treatment which might have reduced the mortality in the 7 fatal cases. It is probable that in 3 cases cæsarean section should have been done, and in 1, an appendectomy. In the others the condition was beyond control.

W. N. ROWLEY.

Arnold, J. O.: Better Methods in the Immediate Attentions to the New-Born. *Pennsylvania M. J.*, 1919, xxii, 778.

The author discusses his technique in what is characterized as the "immediate attentions" to the new-born relating to the eyes, the respiratory tract, and the umbilical cord. De Schweinitz is

quoted as stating that 35 per cent of all cases of ophthalmia neonatorum are due to bacteria other than the pus-producing organisms of Neisser. Among physicians and in institutions the Credé treatment is often neglected and improperly used, the errors being due to improper instillation and the use of old solutions of silver nitrate.

Skilled instillation from a proper container of freshly prepared 2 per cent solution of silver nitrate is an absolute preventive of ophthalmia. The author believes that since so frequently this technique is not followed, it is preferable to adopt a technique entirely effective in the prevention of ophthalmia. His own practice is to remove all contaminating birth fluids from the face, as soon as the head is born and before the eyes are opened, with clean cotton or gauze. Twenty or 25 per cent argyrol is then instilled, the instillation being repeated daily for three days or longer if necessary. No case of ophthalmia has developed after this technique.

To clear the respiratory tract and resuscitate the child, the legs are grasped with the left hand as they escape from the birth canal, one or two fingers being inserted between the knees to prevent slipping, the head held down and the back held toward the operator. The author's aspirator is then inserted and the upper air passages are cleared of the birth fluids before the child takes its first gasp. The usual attempts to remove these fluids by rough, inefficient finger gouging excoriates the mucosa and predisposes the mouth to infection. The writer has discarded all the time-honored methods of artificial respiration, believing that they are but feeble means of stimulating the reflexes. The method described will suffice for all excepting the graver forms of asphyxia and in these the absence of reflex sensibility makes them futile. In true asphyxia pallida the prognosis is always grave. Air must be gotten into the lungs promptly and with the least amount of shock and exposure. In such cases, after using the aspirator, mouth to mouth insufflation or the employment of one of the mechanical resuscitators is indicated.

Many cases of infection in the new-born are unrecognized as being due to infection of the cord. It is generally believed, however, that a large percentage of cases of icterus neonatorum are due to umbilical infection, the umbilical vein being a short direct route for carrying infection to the liver. Adair cited a series of one thousand cases with fever in 43 per cent and demonstrable evidence of umbilical infection in 23 per cent. In nearly one-fifth of all cases observed his investigations demonstrated the presence immediately after birth of pathogenic organisms on the cord and surrounding skin, this observation being made in the aseptic surroundings of a modern hospital delivery room. In the treatment the first object is the destruction of the pathogenic organisms in this region and the aseptic sealing of the only wound entrance for infection. The second object is the early, effectual closing of a possible hernial ring. In the writer's ward service at the

Samaritan Hospital it is the routine practice to paint the umbilical region with 3 per cent tincture of iodine, and when pulsation ceases, to clamp as close to the skin margin as possible with a small hæmostat. The cord is then cut on the hæmostat which is left in place until the child is bathed about half an hour or more later, when the nurse removes it, repaints the umbilicus with iodine, and applies a simple gauze dressing.

Iodine is then applied once a day for the next two or three days, the umbilicus being otherwise ignored during the daily bath. The results are entirely satisfactory. For years in private work and teaching students the author has placed a ligature in the natural groove between the skin and Wharton's jelly, trimming the stump down to the smallest possible amount, painting the skin and stump with iodine, and covering with gauze. The result of such treatment is that there are no hæmorrhages or herniæ and fewer cases of icterus or other manifestations of infection.

H. K. GIBSON.

Levy-Solal, E, and Phélip, J. A.: *The Prognosis and Treatment of Umbilical Hernia of the New-Born* (Prognostic et traitement de l'exomphale chez le nouveau-né). *Ann. de gynec. et d'obst.*, 1919, xliii, 407.

The authors refer to congenital umbilical hernia of the new-born. These herniæ are due to an arrest of development in the abdominal wall and are produced either during the embryonic period up to the third month of intra-uterine life or during the foetal period from the third month to the time of birth. The infants have a large umbilical tumor. The article contains the clinical histories of 4 cases

operated upon successfully in the authors' service.

Three of the cases reported were clearly of the embryonic type of hernia, and one, of the foetal type. In the former the characteristic large hernia was enclosed in a thin envelope which was transparent and seemed to be without vascularization and of reduced vitality.

The greatest difficulty in operation and that which particularly increases its gravity is the presence of the liver in the hernial sac. In the case of foetal type reported, the herniated mass was not very large, but a zone of the umbilical wall which was almost completely split had been replaced by a yellowish and parchment-like membrane, thin and transparent in places and showing a strong impulsion on coughing. On the abdominal surface this envelope seemed to be without vascularization in some areas while in others it showed small vascular masses. Omental adhesions were found which evidently were the result of intra-uterine omental inflammation.

Either type of hernia calls for immediate surgical intervention. In the cases reported the operation was performed under general chloroform anaesthesia.

Success in surgical treatment depends upon technical precision and rapidity. If the whole enveloping membrane is not excised at once the exposure of an enormous hernial mass which is difficult to reduce is avoided. The membrane should be excised by degrees from above downward and each area sutured successively, the lips of the wound being drawn together. In this way it will be possible to place the last suture without interference from the herniated organs.

W. A. BRENNAN.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Uteau: When Should a Mobile Kidney Be Fixed
(Quand faut-il fixer un rein mobile?) *Progrès méd.*,
1919, 346.

Treatment by nephropexy in cases of mobile kidney is not always satisfactory. The causes for failure the author believes are faulty technique and absence of indications for the operation. When used in suitable cases he believes this procedure is beneficial.

A fixation operation should not be performed in cases of congenitally displaced kidney or cases in which there are no symptoms. It is indicated by the symptoms alone and not by the degree of the mobility or the complications. The usual symptoms are pain, dyspepsia, and nervous troubles. The three may not co-exist and extensive clinical observations may be necessary to determine just how far they are due to ptosis of the kidney. A nephropexy done under proper conditions will always give good results though they may not be evident until long afterward. W. A. BRENNAN.

Thévenot, L.: The Immediate Treatment of Gun-shot Wounds of the Kidney (Le traitement immédiat des plaies du rein par projectiles de guerre). *Lyon chirurg.*, 1919, xvi, 1.

Thévenot's study of war wounds of the kidney has led him to the conclusion that this organ is very tolerant of injury and that in the majority of cases conservative treatment is applicable. To this point of view the objection has been made that, even though the immediate results of kidney wounds may not be serious, there is always the possibility of secondary hæmorrhage, late kidney infection, urinary fistula, etc. Reports from the urological war hospitals, however, do not substantiate this contention.

In war, therefore, total nephrectomy (partial nephrectomy is but rarely indicated) is seldom performed and the tendency of young surgeons to practice it too often should be checked.

In support of his views Thévenot submits his personal statistics. All of his cases were treated immediately after injury at a distance of 8 or 12 kilometers from the firing line.

There were 21 limited lesions. Conservative treatment in 7 cases gave 7 recoveries. In 4 cases tamponade was done. One of these patients died from an associated liver injury. In 10 cases treated by incision and drainage there were 8 recoveries and 2 deaths. The deaths were due to pleuropulmonary complications and anæmia.

There were 9 cases of extensive kidney lesions. In 1 case the anæmia was such that nothing but

tamponade of the wound could be done. Death followed rapidly. In the 8 other cases, nephrectomy was done. Only 1 patient recovered. Three died from acute anæmia and 4 from associated intestinal injuries. W. A. BRENNAN.

Buerger, L.: Concerning Ascending Renal Tuberculosis. *Am. J. M. Sc.*, 1919, clviii, 482.

The rarity of authentic cases of ascending infection of the urinary tract by the tubercle bacilli is well known. Some authors do not believe that such an infection is possible. Others, however, among them Albarran, Bernard, and Wildbold, have proved experimentally that a tuberculous infection of the kidney may be produced by way of the ureter. This possibility has been demonstrated also by cases reported in the literature, such as those of Hottinger, Wildbold, and Rovsing. Most of the recent observations and studies, however, show definitely that as a rule chronic renal tuberculosis has its inception in the medulla, in some instances in the boundary zone between the cortex and medulla, and in others in the renal papillæ.

Buerger reports several cases which by clinical and pathological evidence demonstrate the possibility of ascending infection of the urinary tract with tubercle bacilli.

The first case was that of a woman, 57 years of age, who complained that micturition was painful and very frequent, there being an almost constant desire to void. Cystoscopic examinations revealed an irregularly shaped ulcer over the anterior wall, near the sphincter, surrounded by inflamed mucous membrane. Both ureteral orifices were negative. Both ureters were catheterized. The urine from both sides was almost clear; it contained red cells but no pus. Separated specimens showed tubercle bacilli in the bladder, but none in the specimens from either the right or the left kidney.

A second cystoscopic examination was made three days later. Both ureters were again catheterized. Tubercle bacilli were present in specimens from the right kidney and the bladder. The right ureteral orifice was somewhat irregular in shape and crenated, but no pus was present. To prevent regurgitation backward into the ureter, the bladder was emptied thoroughly through the cystoscope while the specimens from the kidneys were being collected.

To obtain further light as to the involvement of the right kidney, a third cystoscopic examination was made four days later. This revealed the absence of tubercle bacilli in specimens from the left kidney and their presence in the second, third, and fourth specimens obtained at intervals of five minutes from the bladder and the right kidney, the first specimen being discarded.

In view of these findings, a right nephrectomy was performed. When bisected, the specimen seemed at first perfectly normal, but close inspection revealed several small tuberculous foci in the parenchyma and two small miliary tubercles in the cortex. Recovery was uneventful. Four months after nephrectomy the ulcers had completely disappeared and there was marked improvement. No tubercle bacilli were found in the bladder urine. One year after nephrectomy the patient feels perfectly well, and cystoscopy shows that the bladder is practically normal. In short, the patient presents the seemingly paradoxical phenomenon of a clinical cure of what appeared to be the primary tuberculous focus following the removal of the secondary focus.

In the second case reported there was an extensive ulcerative tuberculosis of the bladder, pyuria from the left side, and the presence of tubercle bacilli in the specimens from the left kidney and bladder in a patient suffering from marked frequency of urination, dysuria, and occasional attacks of pain in the left hypochondriac region. Nephrectomy revealed a somewhat hydronephrotic kidney with tuberculosis of the pelvis, the parenchyma being free except for a few miliary tubercles. The bladder symptoms rapidly disappeared and eight months after operation the patient reported herself practically well.

In the author's opinion these cases demonstrate that, at least in some instances, minimal tuberculous renal lesions when associated with extensive vesical and ureteral change are later involvements of the urinary tract, whether produced by true ascending infection or by late embolic invasion of the kidney. They testify also to the value of nephrectomy in this type of urinary tuberculosis as the constant contamination of the bladder with tuberculous products elaborated in the ureter is an active factor interfering with recovery. T. F. FINEGAN.

Rafin: Hydronephrosis of a Kidney Displaced in the Pelvis; Nephrectomy; Recovery (A propos d'hydronephrose d'un rein en ectopie pelvienne; nephrectomie; guérison). *J. d'urolog. méd. et chir.*, 1919, viii, 121.

Rafin's case was an infected hydronephrosis in a kidney prolapsed into the pelvis which remained latent until the patient, a soldier, was wounded. As a definite diagnosis could not be made from the symptoms, a laparotomy was done. The left kidney was not found in its normal position but in the left iliac fossa was a capsule containing a hydronephrotic pocket. This, however, was not recognized as such by the surgeon, the capsule being mistaken for the bladder mucosa and the pocket for a diverticulum of the bladder.

When the patient was first seen by the author the examination of the catheterized specimen of urine led to the diagnosis of hydronephrosis of the left kidney. Lavage failing to relieve the condition, a nephrectomy was performed and was successful in spite of an immediate severe hæmorrhage. Ectopic kidneys frequently have abnormal vascularization

and the hæmorrhage probably had its origin in a vessel which had escaped ligation.

A prolapsed kidney generally remains quiescent until some pathologic condition draws attention to it. This is usually a hydronephrosis but is rarely diagnosed, being mistaken for an inflammatory lesion of one of the pelvic organs. In Camel's thesis mention was made of only two cases in which a correct diagnosis was made.

Rafin defends nephrectomy as the treatment for infected hydronephrosis. Palliative measures usually fail.

W. A. BRENNAN.

Nicolich, G.: Pyelotomy and Nephrotomy in Renal Lithiasis (Pielotomia a nefrotomia nella calcolosi renale). *Riforma med.*, 1919, xxxv, 758.

In 168 operations for renal calculus done by Nicolich since 1898 there were 33 pyelotomies. This number would have been greater if in his early practice the author had not performed nephrotomy exclusively. Since 1910 he has preferred pyelotomy when indicated.

It has been the general practice to extract kidney calculi by incising the renal parenchyma, even though it would be easier to remove them directly from the pelvis where in the majority of cases they are lodged. While in 1907 Kummel reported unfavorably on the latter method, in more recent years many noted surgeons have demonstrated its utility.

Nephrotomy is not without danger, especially that of hæmorrhage. In 99 cases of aseptic nephrolithotomy reported by Israel there were 16 hæmorrhages with 5 fatalities. Mayo did 4 nephrectomies in 40 nephrotomy cases. In 36 aseptic nephrolithotomies the author was obliged to perform a nephrectomy in 4 cases of hæmorrhage in order to save the patient's life. Hæmorrhage should never occur in pyelotomy, however, if the operation is performed only when it is truly indicated and if in opening the pelvis the incision is not prolonged too far toward the kidney where important vessels may be sectioned. In the author's 33 pyelotomies he had only 2 cases of hæmorrhage which necessitated nephrectomy, the cause being in each case a technical error in prolonging the incision. Pyelotomy does not cause alterations in the structure of the kidney, while nephrotomy is always damaging.

The author has been unable to find the report of any case of death after aseptic pyelotomy. Rafin collected from the literature the reports of 12 cases in 202 nephrotomies in which death occurred. In 36 nephrotomies performed by the author there were 3 deaths, making a total of 15 fatalities in 238 operations.

The principal reason why pyelotomy was abandoned was the fear that a urinary fistula might remain. Such a result has never been observed by Nicolich and he therefore believes the fear is groundless. Another objection to the method was the possibility that all of the calculi might not be removed. With the perfection of the present-day

roentgen examination, however, complete removal is assured.

Bazy's opinion, in which the author concurs, is that as a rule pyelotomy is the operation of choice in cases of renal calculus; nephrotomy should be done only when absolutely necessary as in cases of very large or irregular calculi and in cases of infection which is not sufficient to demand nephrectomy. No precise rules can be laid down with regard to the size of calculi extractable by pyelotomy. In some instances it may be necessary to perform both operations simultaneously.

In performing a pyelotomy the author frees the kidney from its bed in order to expose the posterior wall of the renal pelvis. The pelvic wound is always sutured but not drained. There is no change in the urine following the operation.

W. A. BRENNAN.

Ochsner, A. J.: Stone in the Kidney and Ureter from the Standpoint of the Clinical Surgeon.
J. Am. M. Ass., 1919, lxxiii, 1105.

The writer cites four very interesting cases and draws the following conclusions regarding the treatment.

1. The size of a pelvic stone will usually determine the possibility of its passing spontaneously.

2. In the ureter the primary stone will usually pass after it is once started. Secondary stones may be stopped by cicatricial contractions at some point due to injuries caused by the passage of one or more previous stones.

3. A large proportion of stones of moderate size will pass spontaneously or after dilatation of the ureter with bougies, the use of oil or glycerine injections, or one of the various methods of dilatation, of which the method perfected by Lespinasse seems most effective.

4. At times, simply starting the stone with a bougie will suffice.

5. In the cases of patients suffering from acute renal colic, the use of morphine and atropine hypodermically followed by the ingestion of two ounce doses of glycerine with large quantities of distilled water seems to be of value in aiding the passage of stones spontaneously, especially if the patient is immersed in a very hot bath.

6. The prophylactic measure of taking large quantities of distilled water seems to be effective in preventing recurrences.

7. Sinuses remaining after pyelotomy or nephrotomy will frequently heal after injection with Beck's bismuth paste.

8. The clinician who is alert for the discovery of renal or ureteral stones, who takes into consideration the history and physical findings, will rarely miss a correct diagnosis provided he confirms his diagnosis by (1) careful urine examination, (2) X-ray examination with intensified shadows if necessary, (3) the introduction of ureteral shadow sounds, and (4) pyelography in doubtful cases, and provided he considers all points as a whole and does not place

any weight on negative findings obtained by any single one of the various methods employed.

The most important element in the diagnosis is a carefully written history taken by the surgeon himself. Next in importance is the X-ray examination. The plate should show a distinct picture of the outline of the kidney to be dependable in case of renal calculus.

The cystoscopic examination is especially useful in differentiating between calculus and tuberculosis. This is true also of the microscopic examination of stained urinary sediment and the inoculation of guinea pigs for tuberculosis. When there is obstruction of the pelvis or ureter of the only remaining kidney, the patient in making frequent unsuccessful attempts to micturate develops headache associated with vomiting and uræmia.

Lucas gives the following points for the differential diagnosis between tuberculosis and calculus:

Hæmaturia without pain appears early in tuberculosis; hæmaturia with pain is constant in calculus. Pyuria without pain appears early in tuberculosis; pyuria with pain appears late in calculus. Pus is present in tuberculosis in excessive amount; in calculus it is minimal in amount. In tuberculosis pain is diffuse, full, constant, while in calculus it is definite, sharp, and intermittent. In tuberculosis chills are common; in calculus they are rare. There is a rise of temperature in tuberculosis, especially in the afternoon; in calculus this is not often noted. Tubercle bacilli are sometimes present in tuberculosis, while in calculus they are absent. In tuberculosis the ureter is thickened and sometimes palpable; in calculus it is not palpable. C. R. O. CROWLEY.

Rochet: Experimental and Clinical Research upon the So-Called Ascending Inflammations of the Ureter (Recherches expérimentales et cliniques sur les urétértes dites ascendantes). *J. d'urolog. méd. et chir.*, 1919, viii, 257.

The author made a number of experiments on dogs to test the possibility of ascending infections of the ureter and kidney. The results are summarized as follows:

1. Bladder infection occurs much more easily when there is some obstruction in the lower urinary passages than when the urine is able to flow freely into the urethra.

2. Infection of the upper urinary tract also occurs much more easily under these conditions.

3. Following infection the ureter becomes more or less dilated. In animals surviving more than three months after the experiment the ureters were double or triple their normal size. Sinuous and enormous ureters of the type described by Hallé were not observed, probably because the experimental animals did not survive long enough.

4. In cases in which there was some obstruction to the flow of urine the findings of the bacteriological examination of the walls were less clearly favorable to the theory of ascending infection than those obtained in cases in which the flow was free.

A second series of experiments was carried out to determine the possibility of ascending infection in dogs in which a unilateral nephrectomy was done. This series demonstrated better than any other the reality of ascending infections. It was shown that vesical infection ascends into the ureter of the operated side if it remains permeable.

Ascending infection was found to occur as a rule by direct extension along the ureteral mucosa following inoculation by the invading bacteria. Such inoculation required: (1) a certain degree of retention; (2) trauma; (3) or a state of chronic ureteral congestion caused by inflammation of a neighboring organ. In some instances, however, the bacteria may reach the ureter directly by the lymphatic route.

The question as to whether an ascending infection spreads by successive steps along the ureter or becomes generalized rapidly to all the upper urinary tract is extremely difficult to answer. Both types of infection occur frequently and it is impossible to determine what conditions create ascending ureteral infections which are localized for a time, and what others cause an inflammation which diffuses very quickly or even immediately over the entire ureter and to the kidney.

The author finds that the prognosis of ascending infections is more favorable than that of descending affections. They can be cured on the following conditions:

1. If the causal infection of the lower urinary passages is itself curable.
2. If the ascending infection is not of too long standing and has not had time to cause serious anatomical lesions in the ureteral walls.
3. If the kidney is not involved and does not contribute to the ureteropyelitic infection by the downward route.

The author then considers at length the various types of lesions which may be causative of ascending ureteral inflammation and the means to be adopted for the treatment of these different lesions. Whatever the measures used, the principal end sought is disinfection of the urinary tract and a free passage for the urine.

W. A. BRENNAN.

Pignatti, A.: Experimental Ligation of the Ureter Associated with Nephrotomy (Sulla legatura sperimentale dell' uretere associate a neprotomia). *Polichin.*, Roma, 1919, xxvi, sez. chir., 231.

Pignatti gives details of 11 experimental investigations made upon rabbits in which he ligated a ureter and did a nephrotomy. Following such ligation and simple nephrotomy considerable dilatation of the kidney and noteworthy reduction of the parenchyma were observed in about a month. If, in addition, the kidney was decapsulated, the degree of dilatation of the kidney pelvis and the loss in the kidney tissue was very much less.

At a later period following ligation and simple nephrotomy the process evolved slowly toward a typical hydronephrosis. By the eighth month the

kidney was transformed into a globular sac with thin walls and filled with fluid. The findings at the end of a year were about the same. In the experiments in which decapsulation was done in addition, hydronephrosis never developed within this period, the volume of the kidney remained almost normal, and there was no formation of a cystic sac.

The vascular phenomena observed were very different according to whether ligation was associated with nephrotomy alone or with decapsulation in addition. In the first instance, the renal vessels showed passive congestion, but when the kidney was decapsulated rich adhesions were soon formed between the organ and the surrounding structures and there was a neoformation of vascular network to the external surface of the kidney which was manifested more particularly along the nephrotomy cicatrix. The newly formed capsule was always finely vascularized. A sufficient anastomosis between the intra- and extrarenal circulations was slowly effected through the tissue of the nephrotomy wound and this explains why, when decapsulation was done, the kidney parenchyma was sufficiently nourished and the material accumulating in the kidney pelvis was absorbed. In simple nephrotomy there was no impediment to the formation of a hydronephrosis.

The only practical conclusion drawn by the author is that whenever the functional output of the kidney is suddenly arrested by some unknown cause a simple nephrotomy with decapsulation may be tried as it may be of value in preventing the gradual disintegration of the renal parenchyma and obviate the necessity for nephrectomy.

W. A. BRENNAN.

BLADDER, URETHRA, AND PENIS

Brahdy, L.: "Enuresis" of Adults; Hypertonic Bladder. *Ann. Surg.*, 1919, lxx, 482.

Incontinence is frequently considered to be a neurosis which will "wear off in time." This is not correct. There are three types of congenital bladder disturbances which should be differentiated. These types differ in etiology, symptoms, and prognosis. They are:

1. The continuous dribbling of urine. This form is usually accompanied by obvious organic defects of the genito-urinary organs or spinal cord.
2. The persistence of the infantile unconscious reflex. When the bladder has become full, urination takes place. The patient is not conscious of a full bladder or a desire to urinate until after the bladder begins to empty. This condition seldom persists beyond puberty.
3. The occurrence of an urgent desire to urinate when the bladder contains only 150 cubic centimeters or less of urine. Involuntary urination takes place if the patient does not void within a few minutes after the onset of the desire. This form persists into adult life.

Six cases are cited to illustrate the third group.

The signs and symptoms in 50 cases are tabulated as follows:

	Cases	Per cent of cases
Symptoms since infancy.....	49	90
"Weakness" and nervousness in the mother.....	41	82
Other members of the immediate family have similar conditions (7 cases females).....	36	72
Wet bed.....	30	60
Get up at night (no bed wetting)....	16	32
Lumbar pain.....	47	94
Tenderness of lumbosacral spine...	49	98
Drowsiness and easy fatigue.....	49	98
Frontal headache.....	25	
Trabeculated bladder.....	23	89

The author believes the symptoms are due to a hypertonicity of the bladder and tenderness of the lumbosacral spine and advises treatment by dilation with boric acid solution.

A. C. STOKES.

Kelly, H. A.: The Treatment of Papillary Tumors of the Bladder in Women. *Am. J. Obst.*, 1919, lxxx, 328.

In a brief historical review the author recalls the days when not uncommonly in examining the bladder the surgeon bored his finger in through the urethra, an act often followed by incontinence. With the cystoscope all this became changed.

Emphasis is laid by Kelly on the great value of the open air cystoscope in diagnosis and treatment. One of its advantages is its simplicity. Others are that there is no murky medium to be changed and with one instrument it is possible to sweep rapidly over all the walls of the bladder and note every lesion.

Attention is called to the importance of utilizing the natural landmarks as well as an artificial division into hemispheres, which is easily done from the viewpoint of the internal orifice of the urethra. With the use of such landmarks and the end of the speculum as a measure, the first step is to plot out all areas of disease and indicate them on a simple chart. This gives plan and precision to the treatment.

Malignancy in bladder tumors is not always to be determined from the microscopic examination. Some tumors which are classified as malignant by the pathologist are clinically benign and vice versa. An ulcerated and infiltrated base is the clinical test of malignancy.

Occasionally the condition is treated by excision, but as a rule by fulguration and radium. Fulguration does well in some cases but often fails. Radium is applied in the form of emanations on the end of a sound introduced and applied directly to the growth through the open cystoscope or held a slight distance away from it.

A proper dosage of radium is 250 milligram hours over an area 2 by 2 centimeters per month. If 1,000 milligrams are to be used, this means a total

application of fifteen minutes, and if this is divided up into four treatments as seems best, each treatment will last only about four or five minutes. In this way many cases have apparently been cured, including even those in which the condition was malignant and infiltrative.

Barney, J. D.: Observations on the Treatment of Vesicle Calculi. An Analysis of 455 Cases from the Massachusetts General Hospital. *Boston M. & S. J.*, 1919, clxxxi, 462.

Barney analyzes 455 cases of vesicle calculus, 392 of which were operated upon by lithotripsy and 63 by suprapubic cystotomy in the Massachusetts General Hospital from 1870 to date.

The combined mortality of lithotripsy and suprapubic cystotomy was 9.5 per cent. The mortality of lithotripsy alone was 7.23 per cent, and that of suprapubic cystotomy alone, 25 per cent.

Recurrence is to be expected in at least 20 per cent of the cases after lithotripsy but is not as frequent after cystotomy. Patients remain in the hospital on an average of eleven days following lithotripsy and thirty-five days following cystotomy.

Drainage of the bladder is of undoubted value in lithotripsy and an absolute essential in cystotomy.

Barring certain obvious contra-indications, lithotripsy is the operation of choice. Among such contra-indications is the general surgeon's lack of training in the use of the lithotrite and evacuator.

HARRY CULVER.

Bumpus, H. C.: Diverticula of the Posterior Urethra. *Surg., Gynec. & Obst.*, 1919, xxix, 388.

During routine cystoscopic examinations many more instances of diverticula of the posterior urethra are observed than would be expected from the published statistics.

In the author's opinion all congenital diverticula of the urethra are anterior, while diverticula of the posterior urethra are probably traumatic, resulting from calculus, stricture, injuries to the urethra, the rupture of an abscess or cyst, or surgical procedures on the prostate, seminal vesicles, and bladder.

Due to their close proximity to the external sphincter of the bladder and the usually associated chronic inflammatory process, diverticula of the posterior urethra produce symptoms such as: (1) dribbling of urine or complete incontinence; (2) dysuria and often tenesmus; and (3) marked perineal discomfort described as a "ball of fire." The condition is apt to be overlooked unless a direct instrument is used to explore this part of the urethra.

Four cases are reported in some detail with roentgenographic demonstrations. In three of the author's four cases the condition followed operations such as drainage of the seminal vesicles and the removal of vesical and prostatic stones, while in the fourth it was due to the spontaneous rupture of an abscess of a seminal vesicle into the urethra.

Diverticula of the posterior urethra vary in size from very small pouches up to those with a capacity equal to that of the bladder. HARRY CULVER.

GENITAL ORGANS

Luys: The Results of Tunnelling the Prostate (Résultats du "forage de la prostate"), *Presse méd.*, Par., 1919, xxvii, 616.

Tunnelling the prostate consists of digging through the natural route into the interior of the hypertrophied gland to permit a free flow of the urine.

The results of this method have been studied by Luys in 52 cases among which there was no operative death. Excellent and permanent results were obtained in 44 cases. The method failed in only 2 cases and in these the prostate was exceedingly large.

The advantages of tunnelling are summarized as follows:

1. The operation is safe, as proved by the fact that there was no death in 52 cases.
2. It is a non-mutilating operation as it leaves all the organs intact.
3. It can be done in cases of renal insufficiency.
4. Prolonged rest in bed, which in cases of this kind is always prejudicial, is not necessary.
5. Tunnelling of the prostate is the only practical operation for young patients with prostatitis and acute or chronic retention.
6. It sometimes gives results better than those of prostatectomy.

W. A. BRENNAN.

Voronoff, S.: Testicular Grafts (Greffes testiculaires). *Presse méd.*, Par., 1919, xxvii, 588.

Voronoff reports the results obtained in a series of experiments with testicular grafts made on sheep and goats of both sexes, different ages, and either castrated or normal. Altogether he has made 120 of such experimental testicular grafts and all of them have been examined histologically. In 32 cases he implanted the graft beneath the skin, in 65 cases in the testicular sac, and in 23 cases in the peritoneal cavity. Better results were obtained with grafts of fragments of the testicle than when the entire gland was used, and when the grafts were implanted into the testicular sac. In all of his experiments the author sought merely to restore the function of the gland of internal secretion without reference to spermatogenesis.

Voronoff believes that in impotence spermatogenesis is only dormant and may be re-awakened under the influence of the endocrine function. To give support to this hypothesis he cites a great number of observations made on old, weak, and impotent animals whose vigor and sexual power were restored after the grafting of a fragment removed from the testicle of a young animal of the same species. Voronoff suggests that this fact might be applied in the therapeutics of man and that in such event the necessary material might be obtained from the higher type of monkeys as the purpose of the operation is merely to maintain the action of the cells of internal secretion.

The vitality of all the author's grafts has been constant and was histologically controlled.

W. A. BRENNAN.

SURGERY OF THE EYE AND EAR

EYE

Weeks, J. E.: Personal Observations Regarding the Treatment of Glaucoma. *J. Am. M. Ass.*, 1919, lxxiii, 1121.

The author prefaces his remarks upon the treatment of glaucoma with a résumé of the etiological factors. These include various causes of obstruction to the outflow of fluids from the interior of the eye due to blocking of the filtration spaces, sclerosis affecting the lymph spaces at the filtration angle, increase in intra-ocular secretions, and retention of aqueous in the posterior chamber. In 90 per cent of glaucomatous patients there is a history of chronic constipation, the correction of which goes far to relieve hypertension.

When conditions permit, it is the author's practice to try the effect of miotics in all cases, before advising operation. In a high percentage of cases the hypertension may be controlled for a longer or shorter period but operation then becomes necessary because of progressive failing of the fields and vision. A low degree of hypertension can be tolerated if the fields and the central vision are holding their own; if these are failing, operation is required. If the patient's co-operation in the use of miotics is unsatisfactory, operation is indicated.

The author's experience has convinced him that early operation is desirable. Positive improvement in the fields and the central vision after operation is not common, but the progress of the disease is usually delayed or arrested.

The type of operation to be performed must be determined by the characteristics of the individual case. For buphthalmos in the early stages paracentesis of the cornea followed by a long course of miotics usually gives a satisfactory result. When the patient is between 4 and 8 years of age trephining is the operation of choice; a trephine not more than 1.5 millimeters in diameter should be used. Paracentesis usually relieves a secondary glaucoma accompanying an iritis. Rarely an iridectomy upward is required; miotics are usually ineffectual. A filtering cicatrix must be obtained to relieve the secondary glaucoma following sclerokeratitis or interstitial keratitis.

In the treatment of chronic idiopathic glaucoma, the author prefers to make a filtering cicatrix. His results from the Elliot trephining operation, which he has performed 58 times, have not been satisfactory. In a number of these cases there has been a return of hypertension, and in 12 there were untoward complications, 2 of which were late infections. Weeks now limits the use of this method to buphthalmos, some cases with deep anterior chamber, and cases of chronic simple glaucoma

with relatively low hypertension. In 260 cases operated upon by the Lagrange method with a 5 millimeter incision the results have been excellent in all but a few. There has been no case of late infection in this series.

Emphasis is placed upon the importance of the after treatment which consists of daily massage continued for a few days or weeks to force a small quantity of aqueous through the scleral opening gently and secure a better filtering cicatrix. The technique of this massage can be readily learned by the patient.

W. F. MONCREIFF.

Berrisford, P. D.: The Etiology, Pathology, and Pathogenesis of Papilloedema. *Minnesota Med.*, 1919, ii, 385.

Berrisford calls attention to the differences in the precise definition of the terms "neuroretinitis," "descending optic neuritis," and "choked disc." The first by common usage is to be restricted to conditions arising from grave systemic disorders such as diabetes, Bright's disease, syphilis, leukaemia, etc. The second denotes an inflammation of the optic nerve that has advanced peripherally from the brain. The third applies to an inflammation which begins at or in the neighborhood of the papilla and extends toward the brain.

In neuroretinitis and descending optic neuritis there is a swelling of the nerve head with broadening and tortuosity of the veins, white spots, and hæmorrhages along the course of the vessels and in plaques in the retina. In choked disc there is usually a marked swelling of the nerve head with little if any change in the surrounding retina; the papilla is often mottled with hæmorrhages and the vessels are ensheathed with white exudate. "Papilloedema" is a term which is frequently used interchangeably with "choked disc" and "descending optic neuritis" unless there is a very marked papillary elevation.

The author gives data obtained from the literature as to the occurrence of papilloedema in cases of brain tumor, tuberculosis, syphilis, brain abscess, otogenous purulent meningitis, hydrocephalus, thrombosis, intracranial hæmorrhage, aneurism of the cerebral arteries, and cranial deformities.

In regard to the pathology of choked disc it is stated that at times there are definite inflammatory changes but these vary considerably in degree and appear to bear no constant relationship to changes in the meningeal sheaths. The chief feature is oedema, both intra- and inter-fascicular, which extends also for a short distance into the retina. In nearly every case the lamina cribosa is bowed forward. The glial cells are greatly proliferated, especially behind the lamina cribosa. Fibroblasts

appear in the physiological cup and form a membrane over the elevation. The subsequent atrophy is a neurotic degeneration caused by neuroglial proliferation.

In the discussion of the pathogenesis, the theories of Graefe, Schmidt-Rimpler, Leber, and others are discussed. Berrisford leans more toward a compromise between the mechanical theory and a cytotoxic theory.

T. D. ALLEN.

Schweinitz, G. E. de, and Weiner, M.: Cysticercus of the Vitreous. *J. Am. M. Ass.*, 1919, lxxiii, 1187.

This is the fifth case reported in the United States in which the embryo of the pork tapeworm was found in the human eye. The case was that of a girl, 10 years of age, a resident of the United States for thirty-four months, who first complained of diminished vision ten months previous to the examination.

In the lower portion of Descemet's membrane were a number of punctate deposits, and on the anterior capsule of the lens two or three small dots, the remains of iritic adhesions. The iris appeared normal. The vitreous was cloudy; a few fixed vitreous opacities were found in the anterior portions of that body. It was impossible to discern accurately or focus on any retinal vessel.

Anterior to the center of the vitreous was a large globular mass from the lower inner border of which protruded a tubular mass with a necklike constriction and a headlike expansion. On the head were two bright dots, and the position of the hooklets could be discerned. There were active movements of the head, neck, and body, and peristaltic movements of the cyst. The ova were found in the stools.

During an attempt to remove this mass through a scleral opening, the cyst ruptured, and the eye was therefore treated expectantly. Twenty-eight days later enucleation of the eye was done on account of sudden great pain and marked ciliary injection. The specimen was lost before pathologic examination could be made.

T. D. ALLEN.

Cohen, M., and Levin, I.: The Action of Radium on Cataracts. *J. Am. M. Ass.*, 1919, lxxiii, 1193.

In 24 cases of cataract treated with radium improvement resulted in 87.5 per cent. On the basis of the results the authors divide the cases into three groups. In the first group the vision was improved; in the second, the lenticular opacity was diminished; and in the third, the visibility of the fundus was increased. In some instances there was improvement in more than one of these respects. In addition, 5 cases of mature cataract were treated before operation; the postoperative results were as favorable as those obtained in non-treated eyes.

The authors argue that it is inconceivable that the change or the precipitation of certain soluble ingredients in the lens which results in the formation of the opacities can take place without a change in the structure of the barrier membrane, the capsule, and this being a product of cell life, the change therein

must be due to an abnormality in either its structure or its function.

Radium produces very deep changes in cellular function. In the treatment used in the cases reported the alpha and beta rays are filtered off and only the gamma rays are utilized. This is done by covering the radium with brass and photographic paper and placing it on gauze 2 centimeters above the closed eyelid. The duration of each treatment is two hours. Treatments are given once a week.

The article is summarized as follows:

1. The application of radium is harmless.
2. Under the influence of radium the lenticular opacity diminishes.
3. If a cataractous lens becomes mature subsequent to radium treatment and an operation is then required, no difficulties will present themselves.

T. D. ALLEN.

Fox, L. W.: A New Operation for the Relief of Conical Cornea. *Am. J. Ophthalm.*, 1919, ii, 738.

Encouraged in the belief that the cornea has great reparative powers by the work of Wiener on regeneration of the cornea, Wiener's operation for keratoconus and his own results in transplantation, the writer has evolved the following operation for conical cornea:

A Graefe knife is introduced into the cornea about 3 millimeters above its horizontal meridian, with the cutting edge inclined directly forward so as to bisect the cornea straight across, parallel with, but above, the horizontal meridian. Depressing the lower segment with the iris forceps, an iridectomy is done beneath the upper segment. The upper margin of the inferior corneal segment is then grasped with especially constructed forceps and a semilunar strip of cornea, 2 or 3 millimeters wide and including the entire thickness, is removed from the edge. Fine silk sutures are then introduced, one on either side of the pupillary area, the flaps being held by a special forceps having an incomplete fenestrum at the end of either blade and the suture being disengaged by slipping it through the break in the incomplete ring. The sutures are removed at the end of eight days.

Ten cases have been operated upon in this manner with gratifying results. At the conclusion of the operation the cornea was flattened and did not regain its conical shape.

Various methods of treatment for conical cornea are reviewed, such as puncture followed by pressure, division of the recti muscles, excision of small portions of the cornea, and the production of ulceration at the apex of the cornea with subsequent flattening.

S. S. HOWE.

Green, J., Jr.: The Treatment of Dacryocystitis by Curettage. *Am. J. Ophthalm.*, 1919, ii, 723.

Green reviews the literature on the various surgical procedures that have been offered in recent years for the treatment of dacryocystitis. Mention

is made of the use of a probe as advocated by Bowman and others and of the total removal of the sac with the resultant destruction of the physiological function as practiced originally by Meller. Reference is made also to the statement of Chamberlain and Mosher that in all intranasal operations for the relief of dacryocystitis there is the danger of subsequent closure unless this is prevented by frequently repeated probings or the prolonged wearing of a style.

An impeccable surgical method for the treatment of dacryocystitis has yet to be evolved. Thompson lays much emphasis upon the fact that the mucosa in either the sac or the duct is diseased, due usually to the entrance of a foreign body into the lachrymal duct by way of the puncta and canaliculus rather than to an ascending nasal infection. Thompson slits the canaliculus, inserts a Buck's flexible ear curette, and cures the sac walls gently. Search is then made in the duct for an obstruction, and when this is reached, the curette is advanced with an augur-like motion and pressure until it finds its way into the nasal cavity. These movements are repeated until the instrument passes readily through the strictured portion of the duct and the duct becomes freely patent its entire length. Curettes of a larger size are then used in the same manner until an instrument as large as the duct will pass readily into the nose and all sense of roughness at the site of the stricture is gone.

In addition to this technique with minor changes Green passes probes Nos. 5 and 6 of the Theobald pattern through the slit lower canaliculus after washing the sac and duct with a 1:5,000 solution of bichloride of mercury and injecting a few drops of 5 per cent cocaine with epinephrin. This he does (1) to avoid a false passage, since the passage of the probes orientates him as to the direction the duct takes in the particular case, and (2) to gain an opening sufficient to apply the anæsthetic solution to the mucous membrane of the duct. An applicator made tightly around the smallest Buck's curette is used to apply tincture of iodine lightly to the walls of the sac and duct.

The postoperative reaction is slight, but there is some pain, and œdema of the lids and cheek. Cold applications, a boric wash, and the use of a bland ointment are sufficient for the immediate after-treatment.

If possible, Green keeps the patient under observation for some time so that he may pass the No. 10 Theobald probe about once in three weeks, but he does not state for how many weeks these sittings are continued.

The author's conclusions are as follows:

1. The combined operation of curettage followed by immediate rapid dilatation removes any foreign material that may have lodged in the canaliculi, lacrymal sac, and bony duct.

2. If polypi or granulation tissue are present in any part of the lacrymonasal duct, they are effectually removed.

3. Thus prepared, the duct readily admits large probes (T. 11 or 12) and can be dilated up to T. 13, 14, 15 or 16 at the first sitting, thus insuring adequate primary and secondary drainage.

4. The application of tincture of iodine to the mucous surface sterilizes it and stimulates it to normal activity and regeneration.

5. If pus should re-form, the operation can be readily repeated.

6. The operation is an office or outpatient operation and is often successful even when the patient cannot return for subsequent observation and probing.

7. Should this method fail, the sac can be extirpated or destroyed as readily as if an operation had not been performed.

J. S. CLARK.

EAR

Horn, H.: The Rôle of the Labyrinth in Flying Efficiency—A Study of 768 Cases at the Third Aviation Instruction Center, Issoudun, France, A. E. F., from September, 1918, to January, 1919. *Ann. Otol., Rhinol. & Laryngol.*, 1919, xxviii, 381.

The author's contribution, which is based on material gathered in the American Expeditionary Forces before the work done in the United States had become accessible, deals mainly with the otological side of efficiency tests for the selection of men for aviation service.

Two main groups were promptly recognized: (1) those who complained of a hypersensitiveness to motion with disturbing labyrinth symptoms of various kinds which would in some way interfere with flying; and (2) those who gave no history of hypersensitiveness to motion but in whom during routine examinations the labyrinth findings characterizing the first group were found.

The hypersensitive type when recognized should be admitted to the service only after very careful consideration. While it has been found that a hypersensitive labyrinth may be able to accommodate itself to the requirements of successful flying, this does not alter the fact that among the select and successful aviators those that are hypersensitive to motion are few.

In questioning candidates an attempt was made to chart a history of hypersensitiveness to motion, which included sea sickness, sickness due to swinging and merry-go-rounds, car sickness, and air sickness due to the motion of the plane. According to the author's tables, it is very rare that a person is sensitive to one type of motion alone.

Of 76 men affected with hypersensitiveness to motion, 40 were obliged to discontinue or modify their air career, and 17 (22 per cent) of these were grounded from this cause alone. The obvious conclusion is that special care should be exercised in allowing candidates with hypersensitiveness to motion and nystagmus of from thirty to thirty-five seconds to enter the service. Thirty-five seconds is

the extreme margin of safety. The author emphasizes the fact that the nystagmus time is temporarily increased by local or general infection, the focal infections of the teeth or the more common infection of influenza, and that many deaths are directly attributable to accidents which occur while the men are still affected by infective conditions from which they have only partially recovered.

Cases of subnormal labyrinth with hyposensitive-ness proved to be extremely rare, and very little evidence of any kind has been produced that a hyposensitive labyrinth interferes with flying ability or dulls the perception of special localization and movement. The essential point is the possession of a perfectly intact, well-balanced labyrinth, the lower limit being a matter of very little moment. Given an intact and well-balanced labyrinth, there is nothing to indicate that the lower limit of nystagmus is of consequence even as far down as thirteen seconds.

Experience in the field has shown that the nystagmus time and the time of other vestibular reactions are not materially lowered by practice, the labyrinth reactions not being changed in any essential particular as a result of continuous air work, acrobatic work, or work over the lines.

Twelve tables of labyrinth findings and statistics, symptoms and reactions, evidence of hypersensitivity to motion, and a study of American aces complete the article.

J. J. KING.

Fraser, J. S.: Two Cases of Fracture of the Base Followed by Otitis Media, Meningitis, and Death. *Proc. Roy. Soc. Med.*, Lond., 1919, xii, Sect. Otol., 103.

In the first case the line of fracture passed through the internal meatus and vestibule and the injury was followed by infection of the effused blood, suppuration in the middle and inner ear, and meningitis. The injury occurred February 11, 1917, and the patient died on February 15.

In the second case, the patient, a child 6 years of age, suffered from fracture of the base of the skull in August 1913, but at that time made a good recovery. One year later, however, death occurred from purulent meningitis following an attack of double suppurative otitis media. The labyrinth was not involved and it is reasonable to suppose that the infection passed through the preformed path made one year before when the skull was fractured. The postmortem examination of the ear showed that the incus was dislocated into the mastoid antrum and that there was a fracture of the roof of this cavity. Detailed microscopic reports are added.

O. M. ROTT.

Hill, F. T.: A Study of the Aural Complications of the Recent Influenza Epidemic, with Special Reference to the Clinical Picture. *Ann. Otol., Rhinol. & Laryngol.*, 1919, xxviii, 497.

In the author's experience with a series of 6,870 cases of influenza observed at the United States

Army General Hospital No. 14, Fort Oglethorpe, Ga., acute middle ear suppuration was an infrequent complication (120 cases, including 17 bilateral). The percentage of cases of influenza which developed acute suppurative otitis media as a complication was 1.75. About 50 per cent of these occurred in patients having pneumonia, the percentage being 4.12. In cases uncomplicated by pneumonia the percentage was 1.02. Mastoiditis developed in 21 of the 120 cases, in 2 instances being bilateral. One patient succumbed to meningitis.

The comparatively few cases of otitis media as a sequel of influenza, especially influenza complicated by pneumonia, showed certain very interesting, if not unique, features. In this type of middle-ear inflammation there is first a hyperæmia and then an acute hyperplastic œdema of the mucous membrane of the middle ear, a definite and characteristic picture which includes a drooping of the canal wall. This flattening involves the whole superior canal wall and occurred in practically every case. Occasionally the posterior canal wall was pushed forward at its innermost portion.

The flattened superior canal wall in these cases is not to be interpreted as a sign of suppurative mastoiditis. X-ray examinations of cases at this stage showed simply a slight obscuring of the mastoid, a cloudiness about the antrum, or a normal cell picture. Destruction of the cell walls was not evident. The signs of suppurative mastoiditis indicating operation are an increased purulent discharge, and a thickened mastoid periosteum; possibly also mastoid tenderness and cedema and a boggy membrana tympani.

J. J. KING.

Fraser, J. S.: Otosclerosis Associated with Fragilitas Ossium and Blue Sclerotics, with a Clinical Report of Three Cases. *Proc. Roy. Soc. Med.*, Lond., 1919, xii, Sect. Otol., 126.

In the author's opinion the association of otosclerosis with fragilitas ossium and blue sclerotics does not entirely explain the pathogenesis of otosclerosis. Just as the fragile bone requires the application of some force before it breaks, so the defective labyrinth capsule (granting the hereditary factor) requires some infective agent before otosclerosis develops. There is much too great a tendency to attribute otosclerosis to one single cause alone such as heredity, disorders of the endocrine-gland system, toxin absorption, otitis media, or a weakening of nerve influence. It seems to the author quite probable that several or all of these causes may be combined.

To quote: "No one can deny that heredity plays an extremely important rôle, but on the other hand there are undoubtedly many cases in which no family history of deafness can be obtained. Our knowledge of the endocrine glands and of pathological chemistry is at present too vague for us to be able to dogmatize on these subjects, but apparently the hypophysis does seem to have some influence on the development and growth of bone. Gray

holds that toxæmia plays an important part in the production of otosclerosis. Loss of nerve influence has been put forward by some as a most important factor in the production of the disease, and Gray's recent book tends to emphasize this point. It is of interest to note that the female sex is especially affected by such conditions as osteomalacia, fragilitas ossium, and otosclerosis, and that pregnancy and the puerperium have a very prejudicial effect on the last of these conditions. The question of the importance of otitis media is much disputed. I hold that an attack of otitis media may be compared to the 'match which fires the magazine.' The hereditary tendency corresponds to 'the powder.' The loss of nerve influence and disorders of the ductless glands, which preside over the processes of bone formation and repair, may be compared to 'a want of water with which to extinguish the flames.'"

O. M. ROTT.

Blackwell, H. B.: Perisinus and Epidural Mastoid Abscess Subsequent to Influenza. *Laryngoscope*, 1919, xxix, 587.

This article is based on cases with somewhat unusual features illustrating types of mastoid supuration characteristic of influenza. The patients were young adults, one woman and two men, who exhibited evidences of a postaural subperiosteal inflammation. In addition, operation disclosed in each case the presence of a large perisinus or epidural mastoid abscess.

The author summarizes his findings as follows:

1. The evidence of marked local destruction in mastoiditis due to the presence of the streptococcus is a significant feature of the otitic complications of influenza.

2. The latent manner in which the condition developed in the cases reported suggests the probability of the presence of an unsuspected perisinus or epidural mastoid abscess in other cases of aural disease following influenza. The importance of otological examination is clearly indicated by the patient's history, not only when earache is present, but whenever aural disturbances accompany and follow influenza and pneumonia.

3. As regards operation in such cases, the importance of leaving protective granulations overlying the sinus or brain undisturbed should be emphasized. All microscopic evidences of diseased bony mastoid structure should be removed. In addition to the usual technique of the simple mastoid operation, gentle curettement of the epitympanum without, of course, disturbing or dislocating the ossicular chain is to be recommended. This procedure has given very satisfactory results

J. J. KING.

Canfield, R. B.: The Pathology of Mastoiditis, with Especial Reference to Its Clinical Significance. *J. Michigan State M. Soc.*, 1919, xviii, 524.

Canfield describes the pathologic changes occurring in mastoiditis, acute and chronic, and dis-

cusses their clinical significance. While pus is probably present in the antrum and neighboring mastoid cells in every case of suppurative otitis media, this does not mean bone infection. As long as the pus makes its escape freely into the middle ear, the disease in the mastoid may be limited to hyperæmia, swelling, and small-cell infiltration of the antral lining membrane. When, however, the infection is of sufficient virulence or when drainage is interfered with, either by the formation of granulation tissue in the aditus or by the presence of pus in the mastoid cells, escape from which is for anatomical reasons impossible, retention takes place, the bone is attacked, and mastoiditis is set up. The area first affected is the mastoid antrum; the mucoperiosteal lining becomes densely infiltrated and suffers a loss of substance. The antrum then becomes filled with infected granulation tissue and pus. This serves as a primary focus from which extension of the disease process takes place as the result of:

1. Direct extension due to pressure of the pus and granulation tissue upon the mucoperiosteum through which run the nutrient vessels of the mastoid cells. The result is destruction of these vessels, necrosis of the walls of the antrum, and enlargement of the primary focus.

2. Gravitation of the pus into remote parts of the mastoid and the formation of secondary foci of disease.

3. Extension by means of vascular channels.

The clinical significance of these facts is that it is impossible to determine where necrosis ends and healthy cells begin and therefore the safest procedure is to remove all cellular structures wherever they are found.

Chronic mastoiditis presents four different and distinct processes:

1. Hypertrophy and hyperplasia of the mucoperiosteal lining with conversion into chronic granulation tissue when the lining loses its epithelial layer. This tissue may persist or may be transformed into bone with complete eburnation or sclerosis.

2. Bone with complete eburnation or sclerosis.

3. If the hyperplasia of the antral mucosa is sufficient to prevent the escape of pus into the middle ear, necrosis of the mucous membrane follows, exuberant granulation tissue forms, the blood supply of the walls of the antrum is cut off, and caries results. Extension of the necrotic process can take place beyond the confines of the mastoid cells into the brain or sinuses. Caries and sclerosis are almost always associated, in which case caries is generally most marked in the tympanum and the neighborhood of the antrum, while sclerosis is most marked in the more superficial areas. The result is that the deeper parts are converted into an abscess cavity the purulent contents of which is in intimate contact with the brain, while the superficial parts form a wall of dense ivory-like bone which renders the perforation and escape of the pus externally impossible.

4. Cholesteatomatous formation. This consists of an in-growth of epithelium. If there is no caries and the suppurative process is of a low grade, it is a curative process. If the discharge is profuse, however, or if caries is present, proliferation and desquamation are very rapid. The walls of the antrum become lined with this newly formed membrane of epithelium, and when partial obstruction occurs the discharge collects under pressure sufficient to destroy the walls of the antrum and neighboring cells. When associated with caries, the pressure of the cholesteatoma is frequently sufficient to destroy the walls of the mastoid and to allow infection to reach the internal ear or brain.

The clinical significance of chronic mastoiditis depends upon the fact that the extent to which the necrotic process has advanced can never be foretold. As 75 per cent of all brain abscesses and the majority of all cases of suppurative mastoiditis are of otitic origin, and as the dura and sinuses may be involved without causing symptoms, the presence of a chronic discharging ear cannot be regarded with composure by even the most optimistic.

O. M. ROTT.

Goldstein, M. A.: Local Anæsthesia and the Mastoid Operation. *Laryngoscope*, 1919, xxix, 559.

A series of 20 acute mastoidectomies were successfully performed by the author under local anæsthesia in the service of the Section on Head Surgery at the Camp Dodge base hospital. By successful per-

formance he means a minimum of pain, a minimum of risk to the patient's health, and 100 per cent recovery.

This form of anæsthesia, devised by Schleich, is based on the principle of diffuse and constant pressure on the nerve distribution in the skin and muscular tissues and is obtained by deep and superficial subcutaneous injections of fluid along or throughout the selected area of operation. The anæsthetic effect depends almost entirely on diffuse pressure on the nerve end-organs and not on the character or strength of the anæsthetic agent. Anæsthesia can be produced with plain sterile water as well as with the ordinary analgesic drugs.

In the author's experience, the most satisfactory anæsthetizing solution is $\frac{1}{2}$ of 1 per cent novocaine in distilled water to which may be added a 1:10,000 solution of adrenalin in equal parts. With the proper technique, the superficial injections being applied subcutaneously and the deep injections under the periosteum, an area of uniform pressure is maintained between the surface tissues and the periosteum with resulting control of all the intermediate nerve elements.

The original article should be consulted for the special technique of the necessary manipulations and for the detailed clinical records of the author's 20 cases of mastoidectomy under local anæsthesia which includes observations on the completeness of the anæsthesia, the conduct of the patient, the character of the invasion, the intensity of the process, the size of the wound, and such other data as throw light on this form of technique.

J. J. KING.

SURGERY OF THE NOSE, THROAT, AND MOUTH

NOSE

Wessels, A. B.: The Pathogenesis of Pachymeningitis Due to Nasal Operations, with Report of Cases. *California State J. M.*, 1919, xvii, 383.

In analyzing the available literature on deaths from meningeal complications following intranasal operations it appears that the greater number are due to operations performed directly on the ethmoid labyrinth. Possibly, however, this is because such operations are more frequent than others. The radical external operation on the frontal sinus is not considered here.

Intranasal instrumentation of the frontal sinus is also responsible for quite a number of deaths, due to fracture of the inner wall of the sinus, extension through the bone, or perforation through the cribriform. Another large number of deaths are attributable to the apparently simple operation for the removal of portions of the middle turbinate. In such cases they are due to direct fracture through the ethmoid and cribriform plate or extension of the infection through the blood stream and lymphatics. In still other instances death has followed the submucous operation on the nasal septum due to hæmatogenous and lymphogenous extension.

Any operation upon the nose, therefore, however slight, may be fatal by reason of complications, recrudescence of an old latent meningitis or a meningitis due to infection through an old perforation in either the ethmoid labyrinth, the cribriform plate, or the internal wall of the frontal sinus.

The author reports one case of his own and three others.

O. M. ROTT.

Black, W. D.: Suppuration of the Frontal Sinus and Its Complications. *J. Missouri M. Ass.*, 1919, xvi, 298.

Black discusses the anatomy and anomalies of the frontal sinus, and the symptoms, diagnosis, prognosis, and treatment of its suppurative affections.

Intranasal procedures are advocated first, the external operations being reserved for: (1) cases that fail to respond to intranasal methods, and (2) the fulminating types. Even when the external methods are employed for the latter types, they should be accompanied by intranasal surgery.

Of the external methods, the Killian, Kundt, and Lothrop operations are mentioned and described. The first two have for their purpose the obliteration of the sinus, while the Lothrop procedure is intended to enlarge the opening for drainage.

If there is necrosis of the floor and anterior walls or a fistula, the author prefers the Kundt operation if the sinus is small and the Killian procedure if the sinus is fairly large.

No operation should be undertaken until an X-ray plate has been made to give information relative to the shape, size, and position of the sinus.

O. M. ROTT.

White, L. L.: Loss of Sight from Retrobulbar Neuritis Due to Posterior Accessory Sinus Disease, with Report of 17 Cases. *Boston M. & S. J.*, 1919, clxxxi, 483, 505.

In spite of the great rarity of the condition described it seems to be generally believed that the cause of the trouble can be determined by a casual nasal examination. Formerly a search was made for pus, caries, or polypoid tissue, but today the importance of a thickened and hypertrophied lining membrane of the sinuses is recognized. Vail states that this is a rarefying osteitis associated with inflammatory swelling and fibrous thickening of the membrane brought about by long-continued hyperæmia. When the hyperplasia does not involve the middle turbinate examination of the nose is negative.

According to Killian, anatomical variations of the sphenoidal sinus are such that in some specimens the blood circulating in the cavernous sinus bathes the whole roof as well as the lateral walls. In one third of a series of cases examined by Frances and Gibson the thickness of bone separating the optic nerve from the sinus measured less than .01 inch.

Up to ten or twelve years ago stress was laid on the intimate relation of the optic nerve to the sphenoidal sinus and pressure was regarded as the all important factor. Since then, however, the condition has been attributed to a local toxæmia because of the rapidity with which retrobulbar neuritis disappears after evacuation of the pus from the sinus.

Negative findings are useless as cases are known of double optic neuritis in which ethmoid and sphenoid disease was unrecognized.

The author emphasizes the seriousness of delay in treatment and the importance of thoroughness in operating.

In the 17 cases reported an operation was performed in 15 and the condition improved in 16. In every case the middle turbinate was removed and in all but one the sphenoid was opened. The posterior ethmoid cells were opened as a matter of routine. The Sluder operative technique was followed. Wasserman, neurological, and dental examinations were made in nearly every instance. S. S. Howe.

Dean, L. W., and Armstrong, M.: Nasal Sinus Disease in Infants and Young Children, Including a Bacteriological Study. *Ann. Otol., Rhinol. & Laryngol.*, 1919, xxviii, 452.

The importance of nasal sinus disease in infants and young children is made manifest by a recital of

the conditions caused thereby, namely, multiple arthritis; imperfect results in posterior cleft-palate work; a tendency to the development of a temperature of 101 and evidence of respiratory infection without apparent cause; ethmoidal necrosis; cyclic vomiting; nasal discharge; asthma and sphenoid empyema; nephritis; headache; neuralgia of the fifth nerve; neurotrophic disturbances; chorea; pulmonary infections; and laryngitis.

Most of the cases reported were treated in association with either a pediatrician or an orthopedic surgeon or both, and these men were satisfied with the results.

In all cases of infectious arthritis in infants and young children studied by the authors during the past eighteen months, the source of the infection was in the upper respiratory tract, the nasal sinuses, the tonsils, or adenoids, and in no case was it in the teeth, lingual tonsils, gall-bladder, or appendix. The inference is that in children with systemic disease of obscure origin search for the cause should be made in the nose and throat.

Occasionally elevation of temperature and increased joint disease have been noted following operative or other treatment of the sinuses. This the authors have found to be due to injury of the joint during the treatment or operation, and not to any added infection.

The most common symptom in the authors' cases of nasal sinusitis was sneezing. Other prominent symptoms were recurrent stoppage of the nose, frequent colds, nasal discharge, and headache. A history of postnasal discharge is conspicuous by its absence. When a condition characterized by listlessness, poor appetite, underweight, and poor color, such as is often due to diseased tonsils and adenoids, persists after the removal of the tonsils and adenoids and there is a negative report from the pediatrician so far as the systemic condition is concerned, disease of the sinuses is very probable.

The best examination of the nose can be made while the child is under an anæsthetic for the removal of tonsils and adenoids. X-ray plates are necessary to determine the presence and size of any sinus. Bacteriological examination is very essential, especially of the antrum of Highmore which, next to the ethmoids, the authors have found most frequently diseased in the class of cases under consideration.

The most important part of the treatment of nasal sinus disease in infants and young children is the removal of adenoids and diseased tonsils.

Up to July 1, 1918, the authors had examined the sinuses of 234 children, 13 years of age or younger, who were suffering from adenoids. Many of these also had chronic tonsillitis. In 15 per cent of the cases an infection of one or more sinuses was found. The sinus infections were not treated but the tonsils and adenoids were removed and the patients requested to return in four or six weeks for examination. Only 7 returned. Five of the 7 were found to be apparently free from sinus disease. The dis-

appearance of the condition was evidently due, therefore, to the removal of the tonsils and adenoids.

Since July 1, 1918, the authors have investigated the sinuses in 145 cases of adenoids or adenoids and chronic tonsillitis. In 65 there was some definite sinus disease. In these cases also the tonsils and adenoids were removed and the patients requested to return in four or six weeks for examination. Four of the 6 who returned were found to be free from sinus disease.

In 55 cases prior to antra puncture there was no condition, systemic or local, to indicate nasal sinusitis. In only 2 (less than 4 per cent), was pus found in the antral washings; in 8 (approximately 15 per cent), the washings contained clear mucus; and in 44 (80 per cent), neither pus nor mucus. Thirty-nine (70 per cent) of the 55 cases were sterile; in 3 (5 per cent) there were hæmolytic streptococci, and in 24 per cent organisms other than hæmolytic streptococci.

In a second group of 43 cases there was no definite evidence of sinusitis before X-ray plates were made. In the plates, however, one or more sinuses were found to be blurred. The washings of the antra showed no evidence of pus or mucus in 58 per cent. Mucus was present in the washings in 24 per cent of the cases and pus in 18 per cent. Fifty-five per cent of the cultures were sterile; 4.6 per cent contained a hæmolytic streptococcus; and 40 per cent, various organisms such as are often found in the nares.

Of the 98 cases comprising the two groups just discussed, cultural tests showed that bacteria were present in the antra in 35 cases, or altogether, 51 antra. Of this number the staphylococcus was found in 45; the pneumococcus in 13; unidentified gram-negative bacilli in 8; diphtheroid bacilli in 7; micrococcus catarrhalis in 7; hæmolytic streptococci in 5; staphylococcus irritans in 1; and Friedlander's bacillus in 2.

The authors report also a series of twelve cases of arthritis in which there was no improvement after the removal of the tonsils and adenoids, but most satisfactory improvement followed treatment of the sinuses.

O. M. ROTT.

THROAT

MacDonald, P.: A Method of Enucleating Tonsils Which Lessens Bleeding. *British M. J.*, 1919, ii, 437.

In performing a tonsillectomy the author uses a Howarth guillotine with sharp and blunt blades which is modified only in that it has a locking attachment to hold the blades from slipping.

The patient is anæsthetized while lying on his back. The operator, standing at the patient's left side, engages the left tonsil in the guillotine ring, shuts down the dull blade, and locks it. The right tonsil is then engaged. The guillotine is sometimes allowed to stay *in situ* for a few minutes. After turning the patient on his left side with his

face somewhat downward, the operator then removes the tonsils by torsion rather than by tearing. The adenoids also are removed with the patient's face down so that the blood will run out of the mouth. When the operation is finished the patient is turned completely over on his chest and face.

The author states that by his method the tonsils are completely removed in the great majority of cases, the amount of blood lost is reduced to a minimum, and the amount of blood swallowed is greatly lessened.

H. R. LYONS.

Foster, B.: Tonsillectomy in Adults: The Advantage of Operating with a Local Anæsthetic. *Med. J. Australia*, 1919, ii, 349.

It is a commonly accepted opinion that anæsthesia deep enough to abolish pharyngeal reflexes is essential to the success of the Sluder method of tonsillectomy but in the author's opinion the operation is much more simple under local anæsthesia and gagging assists in throwing the tonsil forward, particularly when it is buried. The importance of the eminentia alveolaris in pushing the tonsil through the fenestrum he believes is overestimated for if the tonsillotome is pressed firmly outward from behind and below, the sinus tonsillaris is sufficiently movable to allow the tonsil to be pushed through the ring by counterpressure with the finger, without dragging it forward. The operation advocated is performed as follows:

The patient sits upright in a chair facing a good light. Anæsthesia is then obtained with 7.2 cubic centimeters of 2 per cent novocaine and adrenalin injected into each tonsil, two punctures being sufficient, one at the upper pole of the tonsil and the other at about its center and just outside the capsule. Heath's open tonsillotome, the blade of which is only moderately blunt, is then placed behind and below the tonsil, steady pressure up and outward being maintained while at the same time pressure is made with the finger in the opposite direction. The tonsil slips through the fenestrum with surprising ease. The left hand is then used to press home the blade and sever the tonsil. With the patient in the sitting position a spurting artery is found more easily than when it is hidden in clot as may happen following general anæsthesia, and in such cases a small fully curved needle armed with catgut is passed from behind forward, securing both pillars with one sweep.

S. S. HOWE.

Bowen, W. H.: Some Practical Considerations on the Operation for Removal of Adenoids and Enucleation of Tonsils. *British M. J.*, 1919, ii, 433.

In the author's opinion the present-day method of completely enucleating the tonsils as introduced by Whillis and Pybus is a great step forward in throat surgery. Complete enucleation makes possible a cure in cases in which the old cutting operation has failed. Hæmorrhage and sepsis are the two risks

of the operation. To combat these complications, the author makes the following suggestions which are based on a large number of cases.

The proper time to perform a tonsillectomy and adenoidectomy is between the third and sixth year of age. Early treatment of hypertrophic tonsils tends to prevent complications. The importance of the relation of enlarged tonsils and adenoids to diphtheria carriers should be emphasized. The forestalling of deafness is the most important of all considerations. The operations greatly benefit many so-called backward and listless children. A thickened and retracted membrana tensa will be relieved when the cause is eliminated. Subacute catarrhal inflammation of the middle ear also may be completely overcome.

Adenoid masses may be the cause of an acute surgical mastoiditis, and of a tubal discharge after a radical mastoidectomy. Adenoid growths may simulate all types of nasal conditions, including obstruction, mouth breathing, and a chronic non-productive cough. Disease of the tonsils frequently results in a cervical adenitis and tonsillectomy should therefore be performed early. Diphtheria carriers should be subjected to tonsillectomy as the tonsillar crypts may harbor the infection. Acute follicular tonsillitis is, of course, completely cured by enucleation of the tonsils. The adenoids should be removed in one piece. The faucial tonsils may be rapidly and cleanly removed with the reversed guillotine.

It is advisable to wait until the child is at least 2 years of age before operation. The strong indications for operation are summed up as a discharge from the ears or repeated earache. A tonsillectomy is indicated also when the tonsils have once been the seat of tonsillitis. An operation for mouth breathing in children should be followed by repeatedly reminding the child that he must attempt to breathe through the nose even though it is at first difficult.

The author gives his methods of preparing patients whose tonsils are inflamed. Hæmorrhage after tonsillectomy is frequent and favors sepsis. The operation for tonsillitis should be deferred until one month after infection subsides. Calomel and saline should be given two days previous to operation to deplete the tissues of the throat. No meat should be allowed for two days before operation in order that portions of it may not be left around the teeth as infective foci and the blood pressure will not be raised immediately before the operation by the meat proteins. Calcium lactate should be given the night before the operation.

If hæmorrhage is avoided, the patient is protected against shock, and the operation is not performed during an active bacterial invasion, there is no risk from sepsis. The patient should not be given breakfast on the morning of the operation.

The author is opposed to the use of ether owing to the congestion and secretion it sets up. He used chloroform until ethyl chloride was introduced and now much prefers the latter. The usual dose of

ethyl chloride is 3 cubic centimeters. A very competent anæsthetist is essential. The reversed guillotine method of removing the tonsils is preferred. The dull blade crushes the tissues and reduces the hæmorrhage to a minimum. The adenoids should be removed with one sweep of the curette.

H. R. LYONS.

Moore, I.: The Treatment of Enlarged or Diseased Tonsils in Cases Where Surgical Procedures are Contra-Indicated. *Proc. Roy. Soc. Med., Lond.*, 1919, xii, Sect. Laryngol., 243.

After mentioning the contra-indications, both local and general, to operative procedures on the tonsils, the author discusses the non-surgical (chemical and electrical) methods of reducing or destroying enlarged or diseased tonsils.

The local contra-indications are: (1) acute infective tonsillar conditions such as streptococcal infection, scarlet fever, measles, and Vincent's angina, and (2) the physiological enlargement of a temporary character accompanying the four periods of molar eruption.

The general contra-indications are cardiovascular changes, advanced tuberculosis, syphilis, kidney disease, diabetes mellitus, grave nerve or mental disease, status lymphaticus, and professional use of the voice. Under the cardiovascular changes the author includes: (1) cardiac disease, such as endocarditis and pericarditis; (2) constitutional disease in which anæmia is very marked, such as chlorosis, pernicious anæmia, and Hodgkin's disease; (3) low coagulating power of the blood as in true hæmophilia and purpuric diseases; (4) blood pressure over 225 systolic; and (5) arteriosclerosis.

The chemical methods of reducing or destroying diseased tonsils include the use of absorbents, astringents, and caustics. Absorbents, such as iodine, may be of use in the earlier periods of hypertrophy, but are useless in the ordinary run of cases. Astringents, such as tannic acid and zinc sulphate, are limited in their action simply to the reduction of the inflammatory process and have no influence on the hypertrophy.

Caustics or escharotics include mineral astringents such as silver nitrate and zinc chloride; mineral acids, such as chromic and trichloroacetic acids; and alkaline caustics, such as caustic potash and caustic soda combined with slaked lime.

The mineral astringents are usually mildly caustic but their action is too superficial and too slow. The mineral acids cause marked inflammatory reaction and also act superficially and slowly. Caustic potash causes inflammatory reaction and there is difficulty in localizing its effect.

Caustic soda combined with slaked lime, first introduced by Morell Mackenzie in 1864, possesses many advantages over the potash salt. It does not cause an inflammatory reaction, and as it penetrates rather than spreads circumferentially, its action is more localized. Its effect is also less severe and continues for a longer time, and if cocaine

is applied to the tonsil previously, there is no pain. The results obtained by the author with caustic soda and slaked lime in patients ranging in age from children to old persons have been most striking. The largest tonsils have been reduced to normal size and in disease of the tonsil there has been no blocking or sealing up of septic crypts such as has been observed occasionally following the use of the galvanocautery. Moore therefore recommends this treatment, long overlooked and discarded, as a useful substitute for operation when the latter is contra-indicated.

The electrical treatment of the tonsils includes electrolysis, galvanocauterization or puncture, and diathermic puncture. Electrolysis has been used in the past but the results are not worth the effort. The galvanocautery method was in great favor twenty years ago for cases in which the removal of the tonsils was contra-indicated, and if properly used is often very successful. Diathermic puncture, by which the tonsils may be destroyed, has been employed with satisfactory results in a number of instances.

O. M. ROTR.

Hoshino, T.: The Complete Extirpation of the Larynx in Carcinoma. *Ann. Otol., Rhinol. & Laryngol.*, 1919, xxviii, 466.

From his experience in 16 laryngectomies, the author presents the following summary and conclusions:

1. A complete laryngeal extirpation can be done easily under local anæsthesia with good results.

2. Better results are obtained when there are two flaps in the skin incision, each having its stalk in the side of the neck, than when there is only one large flap with one base.

3. It is better to section the trachea below the larynx and arrange for safe respiration before removing the tumor.

4. The pharyngeal wound should be sewed with a double suture but the mucous membrane should be approximated in the submucous layer.

5. Between the main laryngeal wound and the opening of the trachea a bridge of intact skin should be left as Grueck suggested.

6. At all times the nasopharyngeal cavity must be kept clean after the removal of the larynx.

7. To make conversation possible after the extirpation of the larynx a simple rubber tube may be used, one end of which is introduced into the trachea and the other end held in the mouth. This tube enables the patient to whisper with the help of his lips, teeth, tongue, palate and pharyngeal muscles. The tube is much easier to use than the modern complicated artificial larynx and is liked better by the patient.

8. Most of the patients in the cases reported were males and all were about 60 years old. The localization of the tumor as seen with a laryngoscope was chiefly on the false vocal cords.

9. Permanent cures resulted in 50 per cent of the 16 cases and there were 50 per cent of recurrences.

There were no deaths during or following the operation.

10. The earliest and most common symptom in carcinoma of the larynx is hoarseness of the voice, and this frequently remains the only symptom for a long time. Pain is complained of in only a few cases.

O. M. ROTT.

MOUTH

Nodine, A. M.: The Diagnosis and Treatment of Oral Infections. *Dental Cosmos*, 1919, lxi, 726.

The dental profession has been raised to a higher plane by the recognition of the fact that oral infections have a definite effect upon the general health.

The establishment of this fact was due in part to the more exact diagnoses resulting from the use of the X-ray to discover such infections.

The public is demanding better dentistry and is placing its confidence in the dentist who employs the X-ray and other diagnostic agents to search for oral infections.

The methods used by the dentist should be such that the development of foci of infection in the teeth and tissues upon which these methods are used will be obviated.

When oral infections are discovered they should be eradicated carefully and completely by surgical methods.

The patient's present and future health is of primary importance even though its preservation may require the sacrifice of many teeth.

The prevention of the conditions which make focal infections possible is the highest form of service the dentist can render.

M. N. FEDERSPIEL.

Sanchez Calvo, O.: Lithiasis of the Excretory Ducts of the Salivary Glands (Litiasis de los conductos excretorios de las glándulas salivares). *Med. Ibera*, 1919, Número extraordinario, 1 Cong. nac. de med. y cirug., 103.

Cases of calculi in Wharton's and Stenson's ducts are relatively common but from the beginning the symptoms are easily confused with those of other affections of the floor of the mouth. Sanchez Calvo reports two cases.

The first case was that of a woman 65 years of age who came to his laryngological clinic with a gigantic calculus of Wharton's duct and symptoms so confusing and alarming that the diagnosis was made with great difficulty. The patient was discharged completely cured fifteen days after the operation. The calculus, which was composed of magnesium phosphate, measured 3. by 2 by 1 centimeters and weighed 4.5 grams.

The second case was that of a 22-year-old man who had a ranula complicated by a calculus of Wharton's duct. The usual operation for ranula—extirpation of the sac—was done and an abundant serosanguinous discharge was evacuated. In spite of treatment with astringents, cicatrization occurred

very slowly and a fistula remained which discharged a thin serum. On exploration of the fistula it was discovered that Wharton's duct was obstructed by a exceedingly small calculus. This was extracted with the forceps, and in ten days the patient was completely cured. In the author's opinion, the calculus was the cause of the ranula.

M. M. MATTHIES.

Tilley, H.: Large Submucous Lipoma of the Palate and Pharynx. *Proc. Roy. Soc. Med.*, Lond., 1919, xii, Sect. Laryngol., 189.

In the case reported the left side of the palate was very much swollen and in appearance resembled a severe quinsy, except that the mucous membrane was normal in color and there were no symptoms indicative of the presence of an abscess. Under general anesthesia the tumor was removed by an operation similar to that by which a tonsil is dissected out. Histological examination showed the tumor to be a lipoma.

O. M. ROTT.

McKenzie, D.: An Operation for the Complete Removal of the Soft Palate (Staphylectomy). *Proc. Roy. Soc. Med.*, Lond., 1919, xii, Sect. Laryngol., 239.

It is claimed for the procedure described that by a combination of the use of diathermy and the cold snare the entire soft palate can be removed with little or no loss of blood.

The indication for this operation is malignant disease (epithelioma or sarcoma) of the soft palate, especially when it occurs on the posterior aspect where the new growth can not easily be excised as an island of tissue.

The operation is contra-indicated if the disease has spread so as to involve the bone of the palate as the removal of the soft palate alone would be an incomplete operation.

By using diathermy in making the section it is possible to cut through the tissue of the growth without any risk of disseminating living cancer cells, the tissues in contact with the diathermy terminals being destroyed.

The technique of the operation described is as follows:

1. By means of a diathermy knife terminal a transverse incision is made $\frac{1}{4}$ inch behind the posterior edge of the bony palate and carried through the soft palate to its posterior surface. This incision extends from the level of the alveolar process on one side to the same level on the other side.

2. Using the diathermy knife again, two incisions, one on either side of the base of the uvula, are made from the highest point of the arch of the velum palati to join the first incision. The middle of the soft palate, including the uvula, thus isolated is then removed.

3. The lateral portions of the soft palate are removed by means of Lermoyez' tonsil snare applied close to the lateral wall of the palate (the cold snare is here employed, being gradually tightened) in preference to diathermy, in order to minimize the

risk of secondary hæmorrhage from the arteries entering the soft palate at this point which might follow the separation of diathermy sloughs.

4. The next step in the operation opens the upper part of the tonsil fossa, after which these glands can then be quickly and easily removed. Thus the operation is completed by the removal of the glands

draining the soft palate which otherwise are apt to become the seat of subsequent recurrences.

The gap in the pharyngeal roof formed by the operation can be easily closed with an obturator.

The anæsthetic necessary may be given by the mouth as the hæmorrhage is minimal.

O. M. ROTH.

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SURGERY OF THE NOSE, THROAT, AND MOUTH

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INTERNATIONAL ABSTRACT OF SURGERY

MARCH, 1920

ABSTRACTS OF CURRENT LITERATURE GENERAL SURGERY—SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE

Maylard, A. E.: *The Advantages and Disadvantages of Gauze Packing in Abdominal Operations.* *British M. J.*, 1919, ii, 556.

The facts collected appear to indicate that the question whether packs should or should not be used in abdominal operations pertains only to cases in which there is some form of sepsis.

The advantages of gauze packing are, first, the antiseptic effect obtained from the substance with which the gauze is impregnated, and second, the stimulation of a healthy granulating wound. The same advantages are obtained also in the use of gauze in external wounds.

The structure of the peritoneum, however, introduces factors that tend to make gauze packing disadvantageous. The author relates his experience in leaving a piece of dry, sterilized gauze in contact with the intestines. On attempting its removal it was found to be adherent to the visceral peritoneum, and on separation an acutely injected surface of bowel was exposed. Two cases are cited in which gauze packing inadvertently left in the peritoneal cavity at operation later ulcerated into the intestine.

Gauze packing saturated with a saline or sodium citrate solution is considered less irritating to the peritoneum than dry gauze.

Four other disadvantages of the use of gauze in abdominal operations—more or less related to the length of time the packing is retained—are cited:

1. When not used in connection with a drainage tube gauze may act as a dam to the escape of discharge.
2. The irritating effect of gauze on neighboring coils of healthy bowel leads to a low form of adhesive peritonitis and this may cause obstruction.
3. The longer the wound is left open, the more chance there is of a postoperative ventral hernia.
4. The withdrawal of the gauze is very painful, in some cases general anæsthesia being necessary.

In conclusion the author says:

"Gauze packing should be avoided except under definite and clear limitations. These limitations may be thus expressed: the use of as small a piece of gauze as possible and for as short a time as possible, which equally connotes the avoidance of large packs retained for several days." J. A. H. MAGOUN.

Soresi, A. L.: *Elastic Closure and Systematic Paraffin Gravity Drainage for Clean and Infected Wounds.* *N. York M. J.*, 1919, cx, 753.

The ideal method of closing wounds, whether they are aseptic or infected is, first, to approximate the tissues closely but without undue tension; second, to obliterate any dead space; and third, to insure the immediate evacuation of any liquid that may be present in the wound.

No method used in closing wounds answers the purposes mentioned because the rigid materials employed for sutures, such as silk, catgut, and wires, more or less strangulate the tissues and hamper their blood supply; dead spaces are left in the wound on account of the rigidity of the suturing material; dead spaces are closed either with absorbable material which is a good pabulum for micro-organisms, or with unabsorbable material which acts as a foreign body; and, finally, because the materials used for the drainage of fluid that may form in the wound do not act as drains but hamper reunion.

The first and most important element of success in immediate closure of clean wounds and early closure of infected wounds is thorough surgery. This means the removal of all foreign bodies, dead material, and tissues that will probably die. The affected structures should be reconstructed as near to natural physiological conditions as possible, and tissues and structures that cannot be replaced should not be demolished.

The second requirement is good resistance on the part of the patient. The same brilliant results should not be expected in civil practice that were obtained in war surgery, as in the latter the patients were all healthy young men.

The third requisite is to close the wound tightly with elastic material which, according to the depth and the location of the wound, should be applied only to the surface or deeply in the tissues, or both. Deep sutures are made with elastic threads of pure rubber the size of a lead pencil. These threads are passed through the deepest portion of the wound and tied on both ends on rolled gauze, the tension to be given being easily gauged by gently pulling the threads after they have been tied to the gauze on one side until the tissues are approximated and then tying the other end. Superficial closure is obtained by applying over the wound special strips made of adhesive plaster and rubber bands. These strips are prepared in the following manner:

Take rubber bands, cut them so as to have pieces from 5 to 10 cm. in length according to the tissues to be approximated, and stick the ends to two strips of adhesive plaster.

To close a wound apply one of the adhesive strips to one side of the opening, pull gently so as to give a little tension to the rubber band, and then apply the other strip of adhesive to the other side of the wound so that its walls are approximated by the tension exerted by the rubber band. The tension must be sufficient to hold the wound together without undue strain. In order to make the adhesive plaster adhere better, the skin may be covered with a solution of the common rubber cement used in patching tires, diluted with about 10 parts of ether.

The last requirement in wound closure is perfect systematic drainage. The methods based on capillarity are irrational because all organic liquids are suspensions of cells that will occlude the capillarity of the drain and therefore stop drainage after a short period. If tubes are used, it is necessary for the liquid to climb along them and as liquids do not go uphill except under pressure, drainage by this means would require the presence of quite a large quantity of fluid under pressure which would cause inflammation and reaction of the tissues.

The author's method of drainage is based on gravity and on the fact that neither tissues nor blood nor pus nor any other organic liquid can adhere to the substance used which is paraffin. Paraffin drains are prepared by dipping strips of gauze or silk or linen threads into melted paraffin and allowing them to harden, or by introducing melted paraffin directly into the wound. Prior to closing the wound the paraffin drain is placed in its most dependent part and brought out through a small incision made at a point lower than lowest part. If applied according to the law of gravity, paraffin drains will always drain perfectly because between the paraffin-covered material and the walls of the wound there is always a space that cannot become occluded and through which any secretion can leak immediately into the outside dressing by gravity as soon as it is produced. Paraffin drains used according to the law of gravity are ideal because they actually drain, they are well tolerated by the tissues, they may remain in place for any length of

time, they can be withdrawn slowly day by day until it is believed safe to remove them entirely, and they are never dangerous.

G. W. HOCHREIN.

Freeman, S. L.: A New Method of Applying Heat to Patients in Surgical Shock. *Am. J. Obst.*, 1919, lxxx, 561.

The device for applying heat is constructed as follows:

1. An ordinary hospital bed is elevated at the foot with shock blocks to the height of 12 inches.

2. The patient is covered with ordinary bed clothing plus bed blankets. The blankets are double and three in number.

3. Blanket No. 1 is placed up to the patient's chin, covering the chest, neck, and upper abdomen. Blanket No. 2 is used to cover the legs and feet and placed so that it hangs over the foot of the bed clear to the floor. All blankets should reach to the floor in order to cover the space under the bed on all sides. Blanket No. 3 is then placed so that it overlaps Blankets Nos. 1 and 2. All blankets are placed the long way transverse to the length of the bed.

4. When the blankets are properly arranged the space underneath the bed is entirely covered in by blankets clear to the floor, except at the head of the bed, and is thus made into a closed chamber.

5. A resistance coil lamp is then placed on the floor at about the center of the bed equidistant from all the blankets.

6. The lamp used for generating the heat is the ordinary medium-sized resistance coil heat-generating lamp.

7. It is necessary for the nurse to watch the patient carefully and remove the lamp as soon as the patient's temperature has reached normal or slightly above.

8. The bed may be heated in this manner also before the patient enters it.

9. The results which have followed the use of the method have always been good.

EDWARD L. CORNELL.

Balfour, D. C.: Life Expectancy of Patients following Operations for Gastric and Duodenal Ulcer. *Ann. Surg.*, 1919, lxx, 522.

Life expectancy is the major consideration with the patient, particularly in diseases of the gastrointestinal tract for which operation has been carried out. Recently the records of the Mayo Clinic have been utilized by the Actuarial Society of America under the direction of Mr. Arthur Hunter who determined as accurately as possible the life expectancy of persons who have been operated on for gastric and duodenal ulcer.

A study was made of the 2,431 patients operated on in the Mayo Clinic between the years 1906 and 1915. It is remarkable that of this group of cases the Society failed to trace only 108. The study was made without any regard to the type of operation performed. It shows, first, that the operative mor-

tality from all causes in 545 cases of gastric ulcer in which operation was done during this period was 4.5 per cent, while in 1,684 cases of duodenal ulcer the operative mortality from all causes was 2 per cent. Gastric ulcer carries, therefore, twice the operative risk of duodenal ulcer.

The Society's investigations of the mortality in the years after operation show the following facts:

Gastric ulcer: Five hundred and twenty-one patients were under observation on an average of three and six-tenths years, and in that time 88 (17 per cent) died from various causes.

Duodenal ulcer: One thousand, six hundred and fifty-one patients were under observation on an average of three and four-tenths years, and in that time 85 (approximately 5 per cent) died from various causes.

Gastric and duodenal ulcer: Ninety-one patients were under observation on an average of three and eight-tenths years, and in that time 9 (10 per cent) died.

Hunter's first observations on these statistics are as follows: "The fact that 17 per cent of those operated on for gastric ulcer have died within an average period of observation of three and six-tenths years, and the fact that 5 per cent of those operated on for duodenal ulcer have died within an average period of observation of three and four-tenths years, are in themselves significant. While we cannot tell how many lives have been saved by reason of operation for duodenal ulcer, it may safely be stated that the survival for three and a half years after the operation of 95 per cent is a high tribute to surgery. With such a serious condition as gastric ulcer, a death rate in three and a half years of 17 per cent of those operated on appears to be low. While I cannot prove my statement, I believe that a much larger proportion of persons would have died but for the operation, and that many years of life in the aggregate were saved through surgical treatment."

The chief point of importance in these statistics, however, is gained by comparing the mortality figures of a group of patients subjected to operation for gastric and duodenal ulcer with a group of the general population corresponding in age and in sex.

TABLE 1.

Deaths in group of 521 persons operated on for gastric ulcer:

Years following operation:	Deaths
First	26
Second	21
Third	11
Fourth	7
Fifth	7
Sixth and subsequent	6
	88

Deaths during same period of time in general population group of 521 persons with like distribution as to age and sex:

Years	Deaths
First	8.2
Second	6.5
Third	4.9
Fourth	4.1
Fifth	3.0
Sixth and subsequent	5.6

32.3

The statistics show that the death rate of a group of persons following operation for gastric ulcer is four and one-third times as high as that of a group of the general population of similar age and sex. In the second year the death rate is three and one-fourth times as high, and in the later years still less. The death rate of patients operated on for gastric ulcer, as determined by the statistics of about three and one-half years, was two and two-thirds times the death rate in the general population group.

TABLE 2.

Deaths in group of 1,651 persons operated on for duodenal ulcer:

Years following operation	Deaths
First	22
Second	20
Third	9
Fourth	10
Fifth	11
Sixth and subsequent	13
	85

Deaths during same period of time in general population group of 1,651 persons with like distribution as to age and sex:

Years	Deaths
First	24.0
Second	18.6
Third	14.3
Fourth	11.2
Fifth	8.3
Sixth and subsequent	16.7

93.1

The death rate of a group of persons in the first two years following operation for duodenal ulcer is only that of a group of the general population, and after the second year the mortality is actually less than in the group of the general population. These statistics illustrate very strikingly the fact which has been always recognized by surgeons, namely, that gastric ulcer is a much more serious condition than duodenal ulcer, not only from an operative standpoint, but from the standpoint of after-results, and that as a rule the patient with a gastric ulcer shows much more evidence of impaired general health than the patient with duodenal ulcer.

ANÆSTHETICS

Manine and LePage: General Anæsthesia by Intrarectal Etherization (Note sur l'anesthésie général par éthérisation intra-rectale). *Arch. de méd. et pharm. nav.*, 1919, cviii, 284.

While many surgeons have refused to employ rectal etherization owing to the possibility of severe complications, sometimes fatal, which have been attributed to this method, the authors believe on the basis of their own experience that it is dangerous only if doses greater than from 60 to 100 c. c. are used. Further experience and perfecting of the technique, however, are necessary before a definite opinion as to its true value can be formed.

The authors have employed the method in 16 cases. In only 1 was there a mishap and this was the case of a patient whose general condition was very unsatisfactory. Twenty minutes after the operation was begun the respiration ceased, the skin became markedly cyanotic, and the pulse very weak. Artificial respiration and the injection of stimulants revived the patient, however, and the operation was completed without further incident. Intrarectal etherization is described as follows:

One centigram of morphine is given half an hour before the operation. The patient is then placed on the left side and a No. 16 Nélaton catheter is introduced into the rectum for about 10 cm. According to Dufourmentel, the fluid should not be injected into the colon. If the general condition is good, as much as 100 c. c. may be injected. Otherwise the amount should not exceed 80 c. c. With the smaller dose anæsthesia is slow but may be hastened with a few whiffs of chloroform.

The authors have always used pure ether rather than ether mixed with oil and have never observed irritation of the rectal mucosa or any other inconvenience. Anæsthesia is complete at the end of twenty-five or thirty minutes. The awakening is slow, in the authors' cases taking place from one and a half to two and a half hours after the beginning of the anæsthesia.

Vomiting is infrequent and insignificant. The general condition after awakening and on the day following is better than after inhalation anæsthesia.

The advantages of the method are its simplicity and the facts that it does not require a skilled anæsthetist, the patient is placed in a position facilitating the operation, and the postanæsthetic course is calm. Its disadvantages are that it is slow and prolonged.

Intrarectal etherization has particular indications in surgery of the head and neck. It can be used to advantage also in thoracic surgery.

W. A. BRENNAN.

SURGICAL INSTRUMENTS AND APPARATUS

Barron, N., and Bainbridge, W. S.: The Barron Ladder in the Treatment of Flat-Foot. *Internat. J. Surg.*, 1919, xxxii, 341.

The Barrow ladder is a ladder in which, instead of ordinary rungs, there are steps set at an angle of 35 degrees and a toe-piece to prevent the foot from slipping forward. The toe-piece is $1\frac{1}{2}$ in. deep and the step measures 3 or 4 in. The steps are 18 in. apart. The ladder is from 20 to 25 ft. in length and equipped with a balancing board running alongside. In use it is laid flat on the floor.

The patient steps on the ladder, toes slightly in. He then points one foot forward, keeping all the weight on the other foot until the advancing foot is in position on the next step. He then sways the whole body forward onto the advanced foot and continues as before. Having reached the end of the ladder, he goes backward in exactly the same manner, this time keeping the weight on the front foot while the retiring foot is in position. Having exercised on the steps for fifteen or twenty minutes, he goes backward and forward two or three times on the balancing board.

The ladder is recommended for cases of flat-foot which can be treated by exercise. Its construction is given in detail in the original article.

PHILIP LEWIN.

SURGERY OF THE HEAD AND NECK

HEAD

Sebileau and Vallas: The Operative Treatment of Cancer of the Tongue (Le traitement du cancer de la langue par la méthode sanglante). *Presse méd.*, Par., 1919, xxvii, 595.

Sebileau, agreeing with Butlin, discusses and rejects total amputation of the tongue as he does not believe the benefits obtained are worth the sacrifice. He rejects also the total hemiresection extended to the deep attachments of the tongue which has been recommended by Morestin. However rapid may be the propagation of a tongue cancer from the front inward, the best procedure, he believes, is a limited amputation realizable by the

natural route which may be extended by section of the labial commissure. He condemns lymphadenectomy and routine lymphangiectomy as unnecessary or not possible.

The natural route of approach is the route of choice. For lesions of the posterior half of the tongue, however, the lateral transparietal route must be selected. The transmaxillary route should be reserved for cancers propagated to the floor or vault of the mouth.

The prognosis of amputations through the mouth is favorable. The mortality of operations by the buccal route is 5 per cent; of those by the transparietal route, 30 per cent; and of those by the transmandibular route, 40 per cent.

In discussing the results Sebileau estimates that when operation is performed early 40 per cent of the patients survive more than three years. In cases of old cancers operated upon by the transparietal and mandibular routes the survivors are much fewer.

Vallas is a partisan of extensive ablation of the tongue, the glands, and the intermediate tissues *en bloc*. His incision is made about 2 cm. below and parallel to the lower edge of the maxilla and extends from the median line to the anterior border of the sternomastoid. The facial and lingual arteries are ligated at their origin and the whole cellulolymphatic mass of the submaxillary region is removed. Removal of the carotid glands is done if indicated, the incision being extended.

Postoperative care must be directed principally toward the saliva and food, both of which, rather than blood, may occlude the respiratory passages. The use of a nasal catheter to give food is preferable to gastrostomy.

Local recurrences are rare, but recurrences in the glands are relatively frequent, especially in the region of the hyoid.

Like Sebileau, Vallas believes that total statistics have little value. The statistics for special types of tongue cancer he reports as follows:

1. Cancer of the mobile part of the tongue: In 32 cases operated upon from 1907 to 1913 there were 3 operative deaths and 14 recoveries lasting for more than three years.

2. Cancer of the base of the tongue: These are rarely observed as they are not recognized before they have spread to the pharynx, the tonsils, or the velum. Vallas has operated upon 5 cases by the transhyoid route, with 1 death and with 4 recoveries which continued for less than three years.

3. Cancers which have spread to the floor of the mouth: In 37 cases operated upon the mortality was 45 per cent. Three of the patients survived for more than three years and 1 was without recurrence twelve years after the operation.

Vallas concludes that operation is the only treatment that will give a definite cure. As it is not yet possible to say whether radium therapy should be classed among the palliative or the curative methods, the operative technique of the surgical methods should be perfected as much as possible and whatever extends the limits of operability and improves the operative results should be accepted.

W. A. BRENNAN.

Aboulker, H.: The Surgical Treatment of Buccopharyngeal Cancers (Contribution au traitement des cancers bucco-pharyngiens). *Rev. de chir.*, Par., 1919, lvii, 185.

Aboulker did a radical operation in 28 cases of buccopharyngeal cancer. Various procedures were followed, i.e., ablation by the natural route, which in some cases was enlarged; resection of the ascending branch of the maxilla; laryngotomy by the

subhyoid route; or mediolateral pharyngectomy with total laryngectomy, according to whether the cancer was situated on the floor of the mouth, the buccal pharynx, or the laryngeal pharynx. In the 28 cases there were 10 deaths. In 10 instances the operation was performed under local anæsthesia.

The principal cause of death in these cases Aboulker believes was chloroform anæsthesia which was used in 18 cases. In this group the mortality was 55 per cent. In the 10 cases operated upon under local anæsthesia there were no deaths.

Next in importance to chloroform as a cause of death was gangrene of the operative wound and tracheotomy. As a rule tracheotomy was done to facilitate the induction of chloroform anæsthesia. In the author's 28 cases tracheotomy was performed in 15—in 12 cases of chloroform anæsthesia and in 3 cases of local anæsthesia. Aboulker therefore concludes that tracheotomy should be avoided as well as the use of chloroform.

The operations performed under local anæsthesia were of the most extensive type possible on the face and chin. The author says that nothing more extraordinary can be seen than the spectacle of a patient who has undergone such an extensive operation as pharyngectomy leaving the operating table after an operation which has lasted two hours or more and walking unassisted to his bed.

Aboulker makes systematic clearance of the glands in the subaxilla y, carotid, and supraclavicular regions.

For tumors of the pharynx and the floor of the mouth the author prefers a paramedian section of the inferior maxilla followed by suture. For tumors of the lower pharynx a median or mediolateral pharyngectomy and partial or total resection of the larynx is preferred, according to the case.

The anæsthetic recommended is a 1:200 or 1:300 solution of novocaine with adrenalin. From 70 to 100 c c. can be injected without inconvenience, but 30 c c. suffice even for very complex operations.

Details of the 28 cases are given.

W. A. BRENNAN.

NECK

MacLean, N. J.: The Surgical Treatment of Exophthalmic and Thyrotoxic Goiter, with Special Reference to Bilateral Resection. *Surg., Gynec. & Obst.*, 1919, xxix, 475.

The conclusions drawn are based on the results obtained in 31 cases of true Graves' disease, or cases with positive symptoms of hyperthyroidism in which both lobes of the thyroid were enlarged. There were no deaths. Preparatory treatment, such as absolute rest and medical care, preceded every operation, and in some cases injections of boiling water were given. Bilateral resection was not advocated in all cases. In some, the bilateral resection was done at one operation. In severe cases the minimum amount of one-sixth of the gland was left, while in the less toxic cases somewhat more than

one-sixth remained. Not the slightest sign of myxœdema or hypothyroidism has been noted in any of these cases.

All treatment to be rational should be based on the pathologic condition. Medical treatment should be employed in the first acute stage and operation undertaken when the symptoms again recur or persist for a prolonged period. It is best to perform the operation during the stage of remission. Operation is contra-indicated in acute fulminating cases, following the recent onset of acute intoxication in any stage of the disease, and in cases of organic disease of the heart unless it has been treated.

The preferred anæsthetic is nitrous oxide and oxygen with local infiltration of anocaine and adrenalin. The surgical technique is described in detail.

The advantages of bilateral resection over unilateral lobectomy or unilateral lobectomy with partial resection of the opposite lobe are:

1. Minimum injury to the parathyroids.
2. Absolute safety of the recurrent laryngeal nerve.
3. The fact that if for any reason further removal of the gland should be indicated, as for recrudescence of the symptoms of thyrotoxic activity or the rare but possible occurrence of malignancy, the one side could be completely removed with the assurance that some portion of the gland remained.
4. The avoidance of hypertrophy in the remaining lobe.
5. Preservation of the symmetry of the neck.

C. R. STEINKF.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Shattuck, G. C.: Medical Aspects of Wounds of the Chest in War. *Am. J. M. Sc.*, 1919, clviii, 629.

Shattuck is of the opinion that the physician is more familiar with some of the questions which arise in connection with chest cases than the surgeon. This he believes true whether the dyspnoea is due to a large hæmothorax, pneumothorax, pulmonary œdema, or massive collapse of the lung; whether the circulatory disturbance can be relieved by aspiration or is due to shock or hæmorrhage; whether the temperature is caused by infection of the hæmothorax or is due to some other cause.

The preliminary treatment should consist of rest, warmth, and quiet. Sucking wounds should be closed and hæmorrhage stopped. To arrest bleeding a pad of gauze strapped to the wound will usually be adequate. Pulmonary œdema clears up if the patient is put to bed with the chest slightly elevated and 1/6 gr. of morphine and 1/120 gr. of atropin are injected subcutaneously. During the war patients in a state of collapse were given by rectum infusions of glucose and salt or salt solution by the drip method.

Blood should not be transfused in the presence of a large hæmothorax lest it induce further internal hæmorrhage and lest it add to existing circulatory embarrassment.

Preliminary aspiration should be done in a small proportion of cases in which there is a large hæmothorax or hæmopneumothorax, and an endeavor made to leave the intrathoracic pressure at approximately that of the atmosphere.

In the war hospitals postoperative aspiration was done after twenty-four hours and again after two days, as following operation fluid soon begins to collect in the pleural cavity. In the most favorable cases from 200 to 300 c.c. of fluid and some air were obtained at the first tapping, and so little fluid at the second that further tapping was unnecessary.

For two days after operation morphine was used freely to relieve pain and check restlessness.

Fever of moderate degree is the rule in sterile hæmothorax, but after a few days begins to subside.

Infection should be suspected when the temperature and pulse do not show a downward tendency after a few days; when the amount of fluid in the chest seems to be increasing; when the patient's condition does not rapidly improve; or when, after temporary improvement, he becomes abnormally irritable, there is intrathoracic pain, and the temperature begins to rise again.

Tapping for infected chests was not successful as later it was necessary to operate in every instance.

H. A. MCKNIGHT.

Lebowitz, J. J., and Nadler, W. H.: Penetrating Chest Wounds; Report of 276 Cases Treated in a Base Hospital in France. *Surg., Gynec. & Obst.*, 1919, xxix, 429.

In the cases reported the observations began as a rule six days after the injury.

The mortality was 5.4 per cent. Four patients died as a result of associated spinal wounds, 6 of empyema, 2 of hæmorrhage, 1 of gas-bacillus infection, and 1 of suppurative hepatitis.

The most common event in chest wounds is hæmothorax which in this series occurred in 175 cases. Once the diagnosis of hæmothorax has been made, the early detection of infection is the most important consideration because by early drainage extensive organization of pleural exudate with permanent loss of lung expansion can be prevented. Sterile cases with hæmothorax require no special treatment, but when there is much fluid repeated aspirations are necessary.

The physical findings in the series reported were of interest, especially the high level of the diaphragm, the fixation and retraction of the wounded side in the presence of even very small amounts of fluid, and the distinct breath sounds, tubular breathing, and increased vocal fremitus heard upon auscultation.

over the dull area in chests from which large amounts of bloody fluid were later aspirated. These findings were ascribed to a condition of lung collapse which Bradford considers one of the leading phenomena if not the leading phenomenon of gunshot injuries of the chest.

Pneumothorax occurred in 71 cases, 26 open and 45 closed. Of the open cases 13 remained sterile.

Shock occurred in 21 cases, and hæmoptysis, usually slight, in 95 cases. Subcutaneous emphysema, found in 61 cases, varied from small areas about the wound of entrance to involvement of the entire trunk. Occasionally subcutaneous emphysema associated with one or more wounds of the chest was the only sign of lung penetration.

The surgical treatment of penetrating chest wounds at the base hospital was confined, in general, to the treatment of the complications, chief of which was infection, particularly infected hæmorthorax.

In all cases of hæmorthorax in which the bacteriological examination showed the presence of organisms rib resection was done promptly. For this the surgeon chose the most dependent portion of the chest, bearing in mind the frequent high level of the diaphragm. Clots were evacuated from the pleural cavity. In 11 cases after irrigating with eusol, Carrel-Dakin tubes and a large drainage tube were inserted and eusol was instilled every two hours. The results were very good. H. A. McKnight.

Cartolari, E.: Penetrating Wounds of the Thoracic Cavity (Sulle ferite penetranti nella cavità toracica). *Clin. chir.*, 1919, xxvi, 789.

Cartolari gives a statistical study of the cases which came under his observation. The severely wounded are not considered, nor those who died soon after injury. His statistics contain a high number of rifle wounds due to the fact that the hospital was situated near a mountain sector where artillery could not be used. The symptoms varied considerably. In nearly every case there was a fracture of the ribs. Dyspnoea and hæmorthorax were often pronounced. Subcutaneous emphysema was observed in 15 per cent of the cases. Hæmoptysis was very frequent. In 7 cases it was the only symptom. It was rarely severe and responded readily to therapeutic measures. Pneumothorax occurred in only 3 per cent of the cases. Of the late complications bronchopneumonia was the most serious and empyema came next. One case was complicated by a perforating bullet wound of the spinal column with injury to the cord.

As the thoracic wounds considered were not severe, the operative indications were reduced to a minimum. The patients were put at absolute rest. Morphine was administered and stimulation if necessary. The wound of entrance was disinfected and an aseptic dressing applied.

All pleural wounds were closed by the dressings. Drainage was instituted when necessary. Hæmorrhagic effusions were aspirated when they produced symptoms. No exploratory punctures were made.

The chest on the affected side was immobilized with adhesive strips. Hæmoptysis responded quickly to the ordinary remedies. I. F. Volini.

Rodman, J. S.: Empyema. *Pennsylvania M. J.*, 1919, xxiii, 65.

In this article the author gives his own experience in the treatment of 240 cases of empyema which occurred on the surgical service at the base hospital at Camp Bowie, Fort Worth, Texas, from Sept. 15, 1917, to April 1, 1918, and at General Hospital No. 14, Fort Oglethorpe, Ga., from June 5 to Oct. 10, 1918.

These cases were due to the epidemic of 1917-18, during which, in a little longer period than the three months of November, December, and January, one-third of the command of the Thirty-sixth Division, some 8,000 troops, suffered from measles, which was often complicated by bronchopneumonia leading to empyema, mastoiditis, and other metastatic infections.

In the first group of 50 cases the plan of draining the chest cavity as quickly and as simply as possible was followed; thoracotomy without rib resection was done for the most part under local anaesthesia and drainage provided with one rubber tube of large size. Of the 50 patients thus treated 23 died, a mortality of 45 per cent.

After the first 50 cases, Rodman decided to aspirate in the worst cases and found to his relief that this procedure was distinctly better. As a rule, the improvement in the general condition was marked, the patient appearing less toxic and respiration becoming easier. Usually it was necessary to repeat the aspiration after the lapse of three or four days, at the end of which time the fluid had taken on the character of pus. Following aspiration, thoracotomy with the resection of one rib as low down as possible, usually in the eighth posterior axillary line, became the operation of choice. To this was added irrigation with normal salt solution after one week had elapsed and later irrigation with Dakin's solution. As a result of this treatment the number of deaths decreased about one-half, so that in the first 100 cases the mortality was about 28 per cent.

The plan of aspiration and late operation with rib resection was not changed in the second 100 cases, but routine irrigation with Dakin's solution every three hours through the permanent drainage tubes was added. Later these patients were given open-air treatment and setting-up exercises. In the last 133 cases with the treatment just outlined the mortality dropped to 10 per cent and the average period of convalescence was from five to six weeks.

In the spring of 1918 the author took the course of instruction in the treatment of infected wounds at the Rockefeller War Demonstration Hospital, New York, where he was much impressed by the technique used and the results obtained in cases of empyema. The technique developed there is briefly as follows:

Wide resection of from 2 to 3 inches of the eighth or ninth rib in the posterior axillary line; the introduction of 4 Carrel tubes, each with 20 perforations. 2 tubes being placed upward and 2 downward; and immediate irrigation on the table with full strength 0.5 per cent Dakin's solution, the wound being left wide open but packed with gauze soaked in Dakin's solution sufficiently to steady the tubes, the surrounding skin being protected with sterilized vaseline. A rather voluminous dressing is then placed over the wound and the patient is returned to bed. Instillation of 100 c.c. Dakin's solution every two hours by the nurse and irrigation daily at the dressing complete the procedure. If a bronchial fistula is already present, the use of Dakin's solution in the chest cavity is contra-indicated.

E. C. ROBITSHEK.

Tinker, M. B., and Wattenberg, J. E.: The Treatment of Chronic Empyema. *Ann. Surg.*, 1919, lxx, 545.

The authors' analysis of 80 cases of chronic empyema as treated at U. S. General Hospital No. 26 suggests rational and conservative treatment. Their deductions are made in terms of averages.

The general treatment consisted of fresh air, sunshine, frequent and careful feeding, iron tonics, and stomachics. The local treatment consisted, in the majority of cases, of the use of Dakin's solution which in a few instances was followed by injections of bismuth paste. Ninety per cent of the patients had been operated upon elsewhere.

The average time for the permanent closure of the wound was one hundred and twenty-two days; of healing of the wound after arrival at the hospital, thirty-four days; and of suppuration prior to admission four months. The average length of time that elapsed between the diagnosis and operation was seven and three-tenths days.

Patients operated upon immediately after pus was found did not recover in a shorter period than those operated upon later, a fact which suggests that perhaps in acute cases it might be better to wait nine or ten days before operating. In no case was a cure effected by aspiration alone. The argument favoring the removal of more than one rib was not strengthened.

The technique of the Dakin treatment used consisted of irrigating the cavity once daily with sufficient Dakin's solution to fill it. This was repeated until the fluid returned clear, after which a liberal amount of the fluid was given as an instillation every two hours for the remainder of the day. Several tubes were placed in the various parts of the cavity as originally described in the Carrel-Dakin technique.

When the cavity had diminished to a capacity of 2 or 3 oz. and did not tend to close further, bismuth paste (bismuth subnitrate, 10 parts, vaseline, 90 parts) was used. Prior to using the bismuth the cavity was flushed once daily for three successive days with 95 per cent alcohol.

In addition to the care of the wound itself the patients were given daily lung expansion exercises out of doors and with the Wolfe bottles unless there was some contra-indication. The exercise with the Wolfe bottles was encouraged three times daily, at least three or four transfers being made each time with bottles of a capacity of 1½ liters. Individual records stimulated the patient's interest in his case.

After a month of physical culture the contour of the affected side showed obvious changes. After five weeks of physical culture there was a marked gain in the expansion, circumference, and antero-posterior diameter of the chest and in the body weight.

The results seem to indicate that radical operation is unnecessary in most cases of empyema which are not of too long standing, and that in the majority of cases the recovery of health and strength is readily possible.

W. L. STRANBERG

Regard, G. L.: Treatment of Serofibrinous Pleurisy by Evacuation of the Fluid and Pneumothorax (*Traitement de la pleurisie séro-fibrineuse par évacuation du liquide et pneumothorax*). *Presse méd.*, Par., 1919, xxvii, 564.

The author enumerates the advantages of evacuation followed by pneumothorax in the treatment of serofibrinous pleuritis as follows:

1. The lung and pleura are put at complete rest.
2. The pleural walls are kept well separated from each other and secondary lesions and irritations due to friction are prevented. When the pneumothorax is maintained until complete recovery it hinders the formation of adhesions during the inflammatory period.
3. When the effused fluid is withdrawn the fibrin which it contains is also removed. This fibrin is one of the principal causes of adhesions. Although the fluid constitutes a defense effusion partially immobilizing the lung and keeping the pleural wall apart, total pneumothorax instead of depriving the patient of these advantages increases them.
4. In large effusions this treatment re-establishes the normal equilibrium of the thoracic wall, the mediasinum, the heart, and the diaphragm.
5. It relieves the heart by replacing an incompressible fluid by a compressible gas which exerts only a very weak compressive action on the heart.
6. The treatment prevents the pains due to the rubbing and dragging of the inflamed parietal pleura by the patient's movements.

These advantages have been confirmed in a number of the author's cases, and he is convinced that the treatment described is the best. It may be begun as soon as the diagnosis is made. An injection of 700 to 800 c.c. of air after the evacuation of the fluid is sufficient.

If there are recent adhesions which prevent the retraction of the lung, they may often be ruptured by temporarily increasing the tension of the injected air.

W. A. BRENNAN.

Lyon, M. W.: A Case of Mediastinal Hodgkin's Granuloma, with Perforation of the Chest Wall. *Am. J. M. Sc.*, 1919, clviii, 557.

A case of neoplastic growth having the tissue characteristics of Hodgkin's granuloma and situated primarily in the mediastinum is described in clinical and pathological detail.

The patient was a young, white adult male of good personal and family history. The duration of the condition was sixteen months. The neoplastic mass caused pressure erosion of the chest wall, the right pleura became infected, a retropleural and retroperitoneal abscess developed, and the patient died of toxæmia and exhaustion.

The chief pathological findings were extension of the mediastinal neoplastic growth into the right lung and involvement of the bronchial and mediastinal lymph nodes, many abdominal lymph nodes, and the retroperitoneal and inguinal nodes. Growths resembling metastases were found in the unenlarged spleen, the tail of the pancreas, the right kidney, and the epicardium, and were beginning to invade the myocardium. The liver and the cervical, maxillary, and axillary lymph nodes were not involved.

P. M. CHASE.

Bérard, L., and Dunet, C.: Circling Ankylosis of the Thorax (*Ankylose cerclée du thorax*). *Lyon chirurg.*, 1919, xvi, 147.

Circling ankylosis of the thorax is a condition characterized by the presence of callus causing fixation of several ribs and partial immobility of the thorax. One of the principal factors contributing to the condition is the anatomical disposition of the ribs. Pathologic factors are complicated costal fractures, especially those due to war wounds, and empyema with or without bone lesions.

After a gunshot fracture of a rib, a uni- or multi-costal fracture, the bone fragments set free in the intercostal spaces may participate in osseous regeneration if their vascular supply is preserved. This and periosteal irritation and proliferation involve the ribs above and below in newly formed callus.

The authors report a case in which the seventh, eighth, and ninth ribs were fixed in this manner after the fracture of several ribs by a bullet. The ribs were liberated by resecting the callus *en bloc*.

W. A. BRENNAN.

Federici, N.: Exenteration of the Breast for Cancer (*Svuotamenti [exenteratio] della mammella per forme canceroidi*). *Riforma med.*, 1919, xxxv, 786.

Federici describes what he terms evacuation or exenteration of the breast for cancerous conditions. The operation is less disfiguring than the usual breast amputation and is done in one stage. An upper incision above the breast terminates in the axilla and from this point as the apex another incision is carried down under the breast. This having been done, the breast and tissues as far as the axilla form a large flap which can be lifted up. The site may

then be cleared out with the aid of the bistoury and forceps. After all the affected tissue has been removed the skin flap is returned to its place accurately so as to avoid dead spaces and is sutured. The sutures may be removed after seven days.

Federici has performed this operation in two cases. It is easy to execute and there are no complications. It is not applicable, however, to cases of advanced cancer, being indicated only in cases in which ulceration has not yet occurred and there are no insuperable adhesions. The author's operations were performed only a few months ago.

W. A. BRENNAN.

TRACHEA AND LUNGS

David, V. C., and Miller, E. M.: Gunshot Injuries of the Lung and Chest. *Surg., Gynec. & Obst.*, 1919, xxix, 435.

David and Miller present a group of cases of gunshot injuries of the lung and chest observed in a base hospital some distance from the front. In these cases the chief symptoms were those of the complications and the chief interest the probable functional results which followed in certain types of injury.

From one-half to two-thirds of the perforating wounds of the chest, regardless of the type of missile which caused them, were complicated by hæmothorax.

Sucking wounds of the chest wall were present in 41 per cent of the perforating wounds of the chest due to high explosives and in only 7 per cent of the wounds due to machine-gun bullets.

Fifty-nine per cent of the perforating wounds from high explosives developed an empyema in contrast to 15 per cent of those due to machine-gun bullets.

Pneumonia followed perforating wounds of the chest in only 6 per cent of the cases.

Two patients died, a mortality of slightly over 4 per cent for cases of perforating chest wounds.

In the cases of perforating machine-gun wounds of the chest the general well-being of the patients was notable on an average of two months after their injury. A number of them had physical findings due chiefly to moderate thickening of the pleura with impairment of the normal motion of the chest, but the majority looked and felt well.

Those wounded by high explosive fragments developed some complication; a few had only simple hæmothorax but in some instances this was sufficiently extensive to produce complete lung collapse with displacement of the mediastinum and serious embarrassment of respiration. Empyema occurred in 65 per cent.

Secondary surgical interference was necessary in all but one of the complicated cases, the operations consisting of aspiration of hæmothorax or pneumothorax, drainage of the empyemata by rib resection or re-opening of a sucking wound, and in cases of secondary pulmonary hæmorrhage, repeated blood transfusions.

In 29 cases in which foreign bodies were retained in the chest only 1 successful attempt at removal was made at the front.

Pneumonia developed in 5 of the 29 cases, in all but 1 following wounds due to high explosives.

Empyema developed in one-third of the cases of retained machine-gun bullets and in one-half of those of retained high explosive fragments. The mortality was 3.5 per cent.

All of these complicated cases required surgical treatment. Aspiration, often repeated, relieved those with hæmothorax or pneumothorax, rib resection was done in cases of empyema and lung abscess, and transfusion of blood when necessary.

Seventy per cent of the sucking wounds of the chest were due to high explosive fragments. Sixty-three per cent of the sucking wounds developed an empyema. The mortality of sucking wounds was 6 per cent.

The general condition of the patients after two months was good. The incidence of empyema in gunshot injuries of the pleura or lung was relatively low, as it developed in only one-third of the cases. In sucking wounds of the pleura the empyema developed in most instances a few days after the injury, and in cases of fractured ribs, hæmothorax, or retained foreign bodies, in from fifteen to thirty days after the injury. The process was relatively benign, as would be indicated by the fact that there was only 1 death.

The highest incidence was found in sucking wounds of the chest, 70 per cent of which developed empyema. Of the total number of empyemata, sucking wounds had been present in 40 per cent. While the number of chest injuries was equally divided between wounds due to high explosives and machine-gun bullets, empyema was twice as frequent following wounds from high explosives. Pneumonia developing after wounds of the lung or pleura played a very minor rôle in the causation of empyema.

In the treatment of this class of cases a rib resection was done under local anæsthesia and tubular drainage was employed in most instances. In sucking wounds with empyema drainage through the wound already present was usually sufficient.

The patients were last examined on an average of three months after their injury. At that time 75 per cent of them were in good general condition. Nearly all had moderate to marked thickening of the pleura with more or less immobilization of the chest wall. Seventy per cent had sinuses but large cavities were rare. In a few instances complaint was made of pain in the chest, dyspnoea, tachycardia, and some cough. These usually were cases of large sucking wounds or cases in which the empyema had been insufficiently drained. H. A. McKnight.

Green, N. W.: Lung Abscess. *Ann. Surg.*, 1919, lxx, 539.

In his discussion of the diagnosis of lung abscesses the author states that the presence of a subacute abscess may be suspected when, after pneumonia or

empyema, the temperature comes to normal and then rises and is accompanied by a hacking cough and a fresh appearance of pus in the sputum.

Chronic lung abscess is more easily diagnosed. The patient may appear chronically ill or in fairly good condition except for local symptoms. The chief symptom is a profuse and characteristically foul expectoration, the amount of which varies with change of posture and at different periods of the day. The X-ray will also aid in the diagnosis.

There is always a cough, generally a slight evening temperature, and a certain amount of anorexia. The physical signs are often obscure and of themselves may not lead to a diagnosis of abscess. Generally they are those of localized consolidation with occasionally cavernous breathing. Clubbing of the fingers is a constant concomitant as in bronchiectasis. The sputum is greenish yellow.

The treatment is medical and surgical. Medicines are given to decrease and deodorize the sputum. Posture may improve the condition. In ambulatory cases, standing on the hands may be beneficial. The surgical treatment consists of thoracotomy with resection of one or more ribs and evacuation and drainage of the abscess. The author does not believe that artificial pneumothorax can be of benefit uniformly because the spot which it is desired to collapse is kept out, being fastened by adhesions to the parietal pleura.

Certain lung abscesses with thickened walls may require more extensive surgical treatment than simple drainage. Resection of a lobe may be necessary. The operation done to drain the lung abscess may be performed in one, two, or more stages. The first stage will indicate the patient's power of resistance. W. L. STRANBERG.

Tewksbury, W. D.: Acute Pulmonary Abscess. *N. York M. J.*, 1919, cx, 849.

The author reports in detail 14 cases of acute non-tuberculous pulmonary abscess treated by artificial pneumothorax. All of the abscesses followed operations on the throat or nose, principally tonsillectomy.

Artificial pneumothorax should be used early, while the abscess is in the acute stage. After the abscess becomes chronic it is usually impossible on account of pleural adhesions. The lung is kept compressed over a period of from one to two months and during that time from five to ten injections of gas are given. The cough, fever, and other toxic symptoms usually disappear in one week and the patient can be discharged as cured in from four to eight weeks.

Tewksbury draws the following conclusions from a study of the series:

1. Acute pulmonary abscess occurs more frequently in the right lung; 11 of the abscesses reported were in the right, and only 3 in the left lung.
2. Of the 14 patients treated, 11 were cured and 3 died.
3. With medical treatment alone, cures are obtained in less than 10 per cent of the cases. With

surgical treatment cures result in from 50 to 65 per cent.

4. Artificial pneumothorax used early is the most rational and successful treatment known for acute pulmonary abscess.

Lilienthal, H.: Resection of the Lung for Abscess.
Surg., Gynec. & Obst., 1919, xxix, 443.

Lilienthal reports a case in which extirpation of the lower lobe, the middle lobe, and part of the upper lobe of the right lung was followed by atrophy which left no lung in the right chest.

Fifteen months after a tonsillectomy the patient first showed chest symptoms, cough, hæmorrhages, and foul expectoration, which were followed by intermittent periods of fever, coughing, and the discharge of large quantities of fœtid pus. X-ray examination of the chest demonstrated a cavity of the right lung in the midclavicular line and an area of infiltration from the seventh to the ninth ribs. There was much infiltration into the lung tissue outside the zone of inflammatory reaction.

Under intrapharyngeal gas and ether anæsthesia, a long incision was made in the seventh interspace, the greater part of the seventh rib was resected, and the sixth rib sectioned posteriorly. Adhesions were then separated and all fluid was removed. A large abscess was found between the upper and middle lobes. The lower and middle lobes and part of the upper were then ablated beyond mass ligatures of chromic gut and heavy silk. During this procedure pus appeared at the patient's mouth. After the removal of the major portion of the lung the stump was carbolized and the transfixing ligatures were fixed outside the chest to prevent mediastinal spasm. A large quantity of fluff gauze was packed about the stump and the wound closed without drainage, the packing and ligatures being buried beneath the skin so that at the end of the operation the chest was completely sealed. Before the last suture was tied more than a pint of paraffin oil was poured into the chest and left there.

Later the wound was re-opened, a drainage tube inserted, and about a quart of foul fluid evacuated. The wound was then opened wide because of infection and sloughing, but due to the open bronchi it was impossible to use Dakin's solution.

The case now showing all the evidence of gangrenous pleurisy, the entire chest cavity was packed with gauze, a procedure which was followed by improvement in the local condition.

Later the right phrenic nerve was resected to paralyze the diaphragm but the subsequent X-ray showed that this muscle was already held down by adhesions. The eighth, ninth, and tenth ribs were then resected to aid in collapsing the lower chest. At the end of four months the patient returned to work. Complete closure of the chest took place after a year. At that time the X-ray showed no evidence of lung tissue in the periphery of the entire right side, but a partially aerated lung field was observed at the hilus.

H. A. McKnight.

HEART AND VASCULAR SYSTEM

Norton, W. H.: Myxoma of the Heart Simulating Bronchopneumonia. *Am. J. M. Sc.*, 1919, clviii, 689.

Norton reports a case of myxoma of the heart and reviews the pathology of heart tumors. Primary neoplasms of the heart present such obscure symptoms that little has been written on the subject and text-book descriptions are so brief that a diagnosis can be made only by exclusion.

The case reported presented the symptoms of dyspnoea, palpitation, abdominal pain, burning in the epigastrium, and a rapid pulse. The position of the heart was normal as were also the heart sounds except for a shortened diastole. The diagnosis was acute toxic myocarditis with bronchopneumonia. Retardation and blocking of thought were much in evidence.

Autopsy showed the left auricle filled by a tumor mass implanted by a broad base on the auricular wall. It had been made irregular by polypoid growths which apparently grew in the line of least resistance. These bulged into the fossa ovalis, the right pulmonary vein, and the mitral orifice, so completely filling the cavity that it was difficult to pass a probe between the tumor and auricular wall into the left ventricle. Thus the tumor offered very effective resistance to the flow of blood in either direction. Microscopic examination showed the presence of myxomatous tissue.

For the study of their clinical symptomatology the author divides tumors of the heart into four groups:

Group 1, tumors developed in the auricles: These produce a very marked stasis in the lesser as well as in the greater circulation.

Group 2, pedunculated tumors in the left auricle filling its cavity and sometimes penetrating through the mitral orifice into the left ventricle: These tumors produce symptoms of stenosis and insufficiency with disturbances of compensation.

Group 3, tumors having the right ventricle as their principal seat: The symptoms are about the same as those of angina pectoris, and death occurs suddenly.

Group 4, tumors of the left ventricle and of the valves associated with œdema, dyspnoea, and the signs of aortic insufficiency: The patients die suddenly without having had any special symptoms during life.

The tumor in the case reported belonged to Group 1.
H. A. McKnight.

Bérard, L., and Dunet, C.: A "Dry" Wound of the Thoracic Aorta with Concomitant Wounds of the Liver, Heart, and Vertebral Column; Eighteen Hours' Survival (Plaie sèche de l'aorte thoracique; plaies concomitantes du foie, du coeur et de la colonne vertébrale; survie de dix-huit heures). *Rev. de chir.*, Par., 1919, lvii, 177.

The war brought to light a number of so-called "dry" vascular wounds in which important vessels of large caliber were even completely sectioned

without resulting hæmorrhages such as might be expected.

The authors report the case of a woman who received a revolver shot wound through the aorta. The bullet passed through the dome of the diaphragm, the pleura, and the pericardium, furling the walls of the right ventricle of the heart and traversing the ninth dorsal vertebra. In the aorta was a seton wound.

In spite of these injuries and the double perforation of the aorta the woman survived for eighteen hours after her injuries without any symptoms of internal hæmorrhage. Death then occurred suddenly after she had become pale and cyanotic and had exhibited all the other signs of hæmorrhage.

The authors interpret the survival of eighteen hours by assuming that the vascular lesion was accompanied by a perisymphatic lesion which was immediately translated by vasoconstriction in the region of the wound. The elasticity of the muscular tissue of the aorta permitted temporary obturation of the bullet orifice in the vessel, i.e., there was a veritable defensive arterial spasm due to energetic contraction of the longitudinal and circular muscle fibers. Whatever the cause, however, the aorta recovered its normal tonicity and when this occurred a fatal hæmorrhage into the pleura ensued. Death therefore resulted from an early secondary hæmorrhage due to the cessation of the arterial contraction.

W. A. BRENNAN.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Barthélemy: Lateral Abdominal Herniæ (*Les hernies abdominales latérales*). *Bull. et mém. Soc. de chir. de Par.*, 1919, xiv, 1313.

Spontaneous lateral abdominal herniæ are rare, the statistics gathered by Berger showing only 26 in 10,100 herniæ. Very little, therefore, is known regarding them and especially regarding their formation. It is of the latter that Barthélemy writes.

Omitting the numerous cases of traumatic herniæ, lumbar herniæ, and herniæ due to congenital or other defects of the abdominal wall, the author was able to find the reports of only 20 cases of true spontaneous lateral abdominal herniæ. To these he adds 2 from the clinic of Vautrin and 1 case of his own. In all of these the hernia occurred in adults at the time of strain.

When such a hernia is produced a point of special resistance where pressure causes pain is found on palpation of the abdominal wall. The site of the hernia is remarkably constant, the orifice being always found in the inner third of a line drawn from the anterosuperior iliac spine to the umbilicus. In the beginning the tumor is deep, interstitial, and difficult to outline. Later, however, it is found easily just under the thin and distended layers of the abdominal wall. It is always at the outer edge of the great rectus at the point where the posterior sheath of this muscle forms what is called the Douglas fold.

In discussing the mechanism of the formation of the hernia described, the author states that he does not agree with Cooper who believes the hernia makes its issue by one of the vascular foramina situated on Spiegel's semilunar line. This semilunar line is an anatomical error. Barthélemy finds the cause of the hernia to be the relationship of the great rectus muscle and its sheath. This relationship varies and in some cases the muscle floats freely in the sheath. When the sheath is lax there may be a diverticulum or pocket opening downward and inward. In such cases a hernia may occur in the

diverticulum when a violent effort is made with the body bent over and the mass may then be imprisoned if the body is brought to the erect position suddenly. The possibility of this mechanism was recognized by Mollière who first described it at the Congress of Geneva in 1877. Barthélemy has been able to verify it fully in his own case.

The author concludes that, apart from the herniæ due to trauma or a congenital defect, the majority of all spontaneous herniæ described under the name of "Spiegel's hernia" are herniæ of the external angle of Douglas' fold, and that Mollière was the first to recognize the true mechanism of their formation. Rational surgical treatment should consist of resection of the sac and closure of the external angle of Douglas' fold beneath the rectus muscle.

W. A. BRENNAN.

Masson, J. M.: Recurring Inguinal Hernia. *Minnesota Med.*, 1919, ii, 373.

The author cites statistics which illustrate the proportional numbers of direct and indirect inguinal herniæ and their chances for cure by operation, notes the difficulties met with in operating on the more unusual variations of these types of hernia, gives the age incidence of patients operated on at the Mayo Clinic who have suffered recurrence of inguinal hernia, and describes the method of operation which he has adopted to correct the condition.

The good results usually obtained from operation for inguinal hernia are due to the fact that the intractable direct type represents only about 10 per cent of inguinal herniæ. The statistics of the Mayo Clinic show that if at operation the cord is transplanted or the floor of the canal is closed by some plastic method, a procedure which should be undertaken to safeguard the simplest cases from recurrence, less than 1 per cent of patients with inguinal herniæ suffer recurrence, while if the less radical operation is carried out a little more than 1 per cent will be afflicted a second time. Some statistics show a greater divergence between these numbers.

Indirect as well as direct are found among inguinal herniæ which are difficult to cure. Either may be particularly refractory when associated with a poorly developed internal oblique muscle. The large scrotal hernia tends to draw the internal abdominal ring directly behind the external abdominal ring and so stretches them that the surrounding tissue is poorly adapted to a plastic closure. The saddle bag or direct-indirect hernia necessitates the removal of the portion of the sac accompanying the structures of the cord as well as the direct sac. Sliding hernia does not easily lend itself to correction because the bowel, after being returned to the abdomen through the abdominal ring, tends to exert constant pressure on the line of closure of the canal. Many indirect herniæ in patients over 40 years of age are associated with very large internal rings and atrophied abdominal walls, the evils of a long untreated hernia. The most difficult type to treat satisfactorily, however, is the recurrent hernia which is apt to be of the direct type and is usually the result of injury to the nerve supply of the lower fibers of the internal oblique muscle.

Three hundred and thirty operations for recurrent inguinal hernia have been performed at the Clinic; 58 represent operations on 29 patients suffering from bilateral recurrence; 44 patients had had two previous operations, 20 had had three, and 8 had had four. Although not definite, it seems that the majority of these recurrences follow the so-called anatomical or Ferguson operation, especially when it has been used for direct hernia. Naturally, the more frequent the operation, the greater the difficulty to effect a cure. The statistics given for the age incidence of recurrences show the importance of radical operation for persons of or past middle age because their tissues heal less readily, their inguinal rings are more dilated, and they are more apt to have direct herniæ than children and young adults.

The method which Masson recommends after personal use for the past five years is a slight modification of the Andrews-Bassini operation. He enumerates the exceptions to this method as follows: (1) the adoption of the Ferguson technique in all herniæ associated with undescended testicle and in some instances in infants; (2) the use of the rectus muscle, according to Bloodgood, in all cases in which the internal oblique is not sufficiently strong; (3) the use of the Halsted technique; and, in a few cases (4) ligation of the cord at the internal ring and orchidectomy and closure of the canal as for ventral hernia.

The incision, the finding and removal of the sac, and the manner of closing the wound are discussed. For unilateral rupture the usual oblique incision is used and for most bilateral cases the transverse incision. If the external oblique aponeurosis is incised about $\frac{1}{4}$ in. inside of the inner pillar of the external ring and cut across, the contents of the inguinal canal will be exposed and sufficient aponeurosis left in the lower flap to cover the cord later. The sac is located through an incision about 1 in. long in the covering of the cord close to the internal

ring. If the sac is firmly adherent it is cut close to the neck and the cut end of the distal section is left open. The neck of the sac, freed from the edge of the cremaster and transversalis fascia, is ligated as high as possible.

The stump is transfixed to prevent the slipping of the ligature, and the distal portion is cut off. The free end of the ligature is drawn by a large hand needle through the transversalis and the internal oblique muscle about $1\frac{1}{4}$ in. above the internal abdominal ring. Drawing the neck of the sac tightly up and fixing it to this point by tying the catgut prevents it from pressing at the internal ring during the process of healing. The opening in the cremaster is closed. While the canal is being closed the cord is held out of the way with a piece of gauze. In cases of direct hernia the sac is not opened unless it is large but is simply turned in with its covering of preperitoneal fat. A few stitches placed in the base prevent it from making pressure on the suture line while healing is taking place.

The closure is begun at the spine of the pubis. Continuous chromic catgut is used to approximate the internal oblique and external oblique muscles down to Poupart's ligament. The cord structures are covered by the lower layer of the external oblique aponeurosis. A stitch or two is inserted above the internal ring.

Light, absorbable suture material, No. 1 catgut, under moderate tension, should be used for the subcutaneous continuous suture. Cutaneous horse hair is preferable for the skin suture.

A light gauze dressing, a suspensory bandage on the scrotum, and rest in bed for about seven days constitute the average postoperative treatment. Patients operated on for recurrent hernia are kept in bed about fourteen days. Light work is allowed in from six to eight weeks and heavy work in from three to six months.

From his study and clinical experience, Masson draws the conclusion that if a hernia recurs within six months after operation the operation was not sufficient or the patient over-exercised after operation. If the recurrence develops after a year's time it is more apt to be due to a new hernia from stretching in the scar tissue or atrophy in the muscle.

Crile, G. W.: The Treatment of Peritonitis. *J. Am. M. Ass.*, 1919, lxxiii, 1655.

The author presents a scheme of treatment for peritonitis which is based on the experience of himself and his colleagues in over 13,145 laparotomies. By this scheme the mortality in all abdominal operations has been decreased $33\frac{1}{3}$ per cent, and in acute appendicitis alone, 67.6 per cent. The essential points are as follows:

1. Nitrous oxide-oxygen anæsthesia.
2. Local anæsthesia at site of incision.
3. Accurate, clean-cut operation to diminish both infection and shock.
4. Adequate drainage.
5. Fowler's position.

6. Vast hot packs over the entire abdomen, spreading well down over the sides.

7. Five per cent sodium bicarbonate with 5 per cent glucose by rectal drip, continued as long as it is tolerated.

8. Primary lavage of the stomach, repeated only if indicated. It will rarely be indicated if anociation is complete.

9. From 2,500 to 3,000 c.c. of physiological sodium chloride solution administered subcutaneously every twenty-four hours until the period of danger is past.

10. Morphine given hypodermically until the respiratory rate is reduced to from 10 to 14 per minute, and held to this rate until danger is past. It should be noted however, that morphine is not useful in a streptococcus peritonitis.

P. M. CHASE.

GASTRO-INTESTINAL TRACT

Brown, T. R.: The Late Results of Supposedly Successful Abdominal Operations on the Digestive Tract. *J. Am. M. Ass.*, 1919, lxxiii, 1501.

As so often the late results of operation on the digestive tract are far from perfect and the patient is left in a condition worse than that preceding the operation, the author discusses briefly some of the factors responsible for this state of affairs, makes suggestions regarding the postoperative treatment from the point of view of the clinician, and outlines certain principles in the treatment of chronic abdominal lesions which may decrease the percentage of failures.

The surgeon has been too prone to attribute undue credit to surgery for the relief obtained in acute abdominal conditions and for the apparent early cure of many chronic conditions when some of the improvement should be ascribed to such factors as rest, careful nursing, change of environment, and diet. If after a few months there is a return of the same or the development of new symptoms, the surgeon is often not cognizant of them for it is to the clinician that the patient is more apt to return with his complaints.

Some of the failures are to be ascribed to a wrong conception of the underlying process. This is true notably in that enormous group of cases of so-called chronic appendicitis associated with high grades of visceroptosis. In these cases both the patient and the physician believe that removal of the appendix will be followed by complete cessation of symptoms when in reality such an outcome is chimerical, to say the least, as the chronically diseased appendix represents but one phase of a diffuse low-grade peritonitis involving the terminal ileum, the cæcum, the ascending colon, and frequently pelvic organs as well.

In none of such abdominal lesions is it safe to rely wholly on the correction of the morphological changes. Because of the failure to consider the associated and often quite persistent functional disturbances,

what should be a successful operation is often unsuccessful. Proper diet, postural treatment, purgation, massage to minimize the formation of adhesions, proper medication for the motor and secretory disturbances associated with the organic lesion add immensely to the chance for a successful issue in this group of cases.

While the clinician is unquestionably too prone to ascribe too much to functional disturbances, the surgeon, on the other hand, is far too apt to be guided by morphological changes alone, and it only by a proper balance between the two in the conception of the disease process and its consequent therapy, both medical and surgical, that the optimum result can be obtained.

The tendency to plunge into surgery in the treatment of chronic and subacute abdominal conditions is too great and there is too little persistence in medical, dietetic and physical therapy before recourse to operation. Until methods have been devised to eliminate the formation of adhesions entirely or operations have been evolved which can absolutely duplicate the normal physiology, if not the normal anatomy, of the various viscera, surgery should not be our first choice. Rather should it be the last resort, to be employed only if skillfully directed therapy along non-surgical lines has been tried conscientiously and for a sufficiently long period of time to prove that it is absolutely unavailing.

Real success in this most difficult field can be obtained only by a closer co-operation between the surgeon and the clinician. The internist should be present at every operation performed upon his patients, and the surgeon should compare the operative findings and the pre-operative clinical data. The clinician's advice may be of aid to the surgeon in the choice of the operative procedure, while on the other hand, the visual demonstration of the pathology of the disease to the clinician will be of inestimable value in his future study of similar syndromes. In the management of the postoperative and convalescent period the clinician, with his knowledge of the patient's previous digestive disturbances and his greater training along these lines, should direct the diet, the medication, and the physical therapy, but should always do so in collaboration with the surgeon. Moreover, he should keep the surgeon posted regarding the subsequent history of the case.

P. M. CHASE.

Leven, G.: A Therapeutic Test Simplifying the Differential Diagnosis in Diseases of the Stomach and Liver (Une épreuve thérapeutique simplifiant le diagnostic différentiel des maladies de l'estomac et du foie). *Presse méd.*, Par., 1919, xxvii, 684.

Many authors have called attention to the fact that gall-stone disease may set up gastric symptoms and that the symptoms of gastric ulcer may simulate those of cholelithiasis. Leven proposes to facilitate the differential diagnosis by what he terms a

"therapeutic test." This test consists of putting the patient on a very restricted diet for four or five days, and on a less restricted but still selective diet for about two weeks longer. Complete rest in bed is ordered for the first week and restriction of all physical and mental effort for the entire period. After the third day sodium bromide is given every two hours, and after four or five days may be supplemented by bismuth carbonate. The bromide and bismuth allay pain spasms and all reflex phenomena and hence remove some of the principal factors which render diagnosis difficult.

The author states that this test plays a double part. If it is efficacious the possibility of disease of the liver as well as a lesion of the stomach can be ruled out. It demonstrates that the condition is merely dyspepsia which can be treated medically. If the test is not efficacious the services of a surgeon are necessary. At any rate, the diagnosis can be made in a few weeks.

W. A. BRENNAN.

Roberts, D.: Certain Limitations of the Roentgen-Ray Diagnosis of Gastro-Intestinal Diseases.
J. Am. M. Ass., 1919, lxxiii, 1511.

While conceding that roentgenology has established gastro-intestinal diagnosis upon a new and more sound basis, the author believes the limitations of the use of the X-ray ought to be admitted and generally understood. Unless the examination is properly made by an experienced operator, the information obtained is apt to confuse the issue rather than to aid. Moreover, even under the most favorable conditions, roentgenology cannot disclose structural changes in the abdominal viscera and therefore a negative roentgen-ray diagnosis of a gastro-intestinal lesion should never be regarded as final in the exclusion of gastro-intestinal disease.

Also in the recognition of the gross abdominal lesions by roentgenographic methods there are many difficulties and some impossibilities. In large part, however, these are failures or imperfections in technique and excusable fallability in roentgenographic interpretation.

Lesions of the œsophagus may give no findings, or findings that are misleading. Cardiospasm may be mistaken for an annular growth or vice versa. In the cardiac end of the stomach, which fills out poorly with an ordinary opaque meal, a pathologic condition may not be apparent unless special efforts are made to demonstrate it. Ulcer or cancer of the posterior wall may give no evidence of filling defects. Early annular growths in the pylorus are compatible with normal roentgenographic appearances, and mucosal ulcers may give no roentgen evidence of their presence. At times deductions relative to the state of activity of a demonstrated lesion cannot be made. Differentiation between ulcer, cancer, and syphilis is also not absolutely possible in all cases.

At the present time not all gall-stones and chronically diseased gall-bladders can be demonstrated. Moreover, the author does not agree with those who contend that the gall-bladder that can

be visualized is a pathologic gall-bladder. The terminal ileum and cæcum offer diagnostic difficulties of the most varied kind, and only when there is the most unmistakable and persistent evidence in support of the clinical picture should the roentgen findings lead to the expression of a definite opinion.

As regards the roentgenographic diagnosis of pathology of the appendix, the author believes it may be made with reasonable certainty only in cases showing definite evidence of deforming adhesions. A retrocæcal position, failure to fill, or undue retention are not in themselves considered sufficient evidence to warrant a diagnosis of a pathologic condition. In the colon, mucosal changes or growths projecting into the lumen without affecting the wall may not be visualized. Small lesions are readily missed and a negative opinion as regards the presence of a low ulcerative lesion should be made guardedly on the basis of the roentgenographic findings.

ADOLPH HARTUNG.

Oehnell, H.: The Internal Treatment of Ulcer of the Stomach with Roentgenologically Demonstrated Niche (Interne Behandlung bei Ulcus Ventriculi mit roentgenologischer Nische). *Acta med. Scand.*, 1919, lii, 1.

The cases reported, 36 in number, were all cases of long-standing, clinically symptomatic stomach ulcer which were undergoing medical treatment and which, on roentgenological examination, showed the typical niche or crater formation referred to in recent years by Handek, Hamburger, and others. One of the patients died. In the case of another the symptoms finally ceased, but it was not possible to obtain further information concerning the progress of the condition. In 31 of the remaining 34 cases the ulcer niche disappeared under continued treatment, and in 3 was much reduced. In 2 of the latter an operation was performed, and in 1, operation was refused. With the disappearance of the niche the remaining clinical symptoms of ulcer also disappeared.

Fifteen cases were followed for from one-half to two and a half years. Among these the symptoms recurred in 2 or 3 cases. In 1 case a roentgenological niche was again observed at the same spot. One patient refused further roentgenological examination.

A number of roentgenological silhouettes illustrative of different phases of the ulcer niche are given by the author; also the details of the treatment.

The conclusions drawn from this study are as follows:

1. As a rule extended medical treatment of ulcer causes the disappearance of a roentgenologically demonstrated niche as well as of the clinical subjective symptoms of ulcer.

2. The time since treatment is still too short to warrant judgment of the final results, but recurrences appear to be strikingly rare.

3. The examination demonstrates that the possibilities of medical treatment in ulcer are much greater than was previously supposed.

W. A. BRENNAN.

Deaver, J. B.: The Operative Treatment of Peptic Ulcer; Removal of the Ulcer with Gastro-Enterostomy, or Gastro-Enterostomy Alone. *Ann. Surg.*, 1919, lxx, 526.

Although the author believes each case must be treated along the lines that give promise of the best results, yet, other things being equal, excision of the ulcer or resection followed by gastro-enterostomy is the procedure of choice.

Excision of the ulcer combined with gastro-enterostomy has given the author excellent immediate and remote results, particularly with regard to gastric mobility. It has not been his experience that spontaneous perforation, if complete, effects a cure. In two cases he observed recurrence of perforation.

Gastro-enterostomy of itself, according to Deaver, may be merely a temporary curative measure for if the ulcer is allowed to remain, it may or may not heal. However, it has been his experience that a gastro-enterostomy properly made and properly placed does not close. The artificial opening must be as large and as near the pylorus as possible.

In cases of ulcer distant from the pylorus with very little exudative induration and cases of saddle-back ulcer and ulcers situated on the lesser curvature nearer the cardia, simple excision or circular resection is the indicated operation.

In cases of perforation of a duodenal ulcer, Deaverplicates the duodenum after closing the perforation and fortifies the area by covering it over with the gastrocolic and gastrohepatic omentum, completing the operation with a posterior gastro-enterostomy.

E. C. ROPITSHEK.

Loeper, M.: Intravenous Injections of Pancreatic Extracts in Stomach Cancer (Les injections intraveineuses d'extrait pancréatique dans les cancers de l'estomac). *Progrès méd.*, Par., 1919, 341.

Trypsin has been the most frequently used of all proteolytic ferments in the treatment of malignant tumors. In cancer the antitryptic power of the blood is increased and, as an action of organic defence, there is an increased flow of proteolytic ferment into the blood. The intravenous injection of pancreatic fluid in cases of cancer increases the antiproteolytic power of the serum and the number and resistance of the red corpuscles. To these advantages there are added also those expressed by the improvement in the general condition and the body weight.

The pancreatic extract seems to act as an antigen; it increases the resistance of the organism to the cancerous products.

The article contains a tabular statement showing the results obtained in 5 cases. W. A. BRENNAN.

Carman, R. D.: The Operability of Cancer of the Stomach as Determined by the Roentgen Ray. *J. Am. M. Ass.*, 1919, lxxiii, 1513.

X-ray examination seems the most certain clinical means of gaining pre-operative information concerning lesions of the stomach. The X-ray evidence of

the size, shape, and position of a lesion, and the roentgen signs of gastric pathology may be the first definite indication of gastric cancer and, when the tumor is not palpable, the only information of value in determining before the incision is made the chances for the removal of the tumor.

The X-ray findings place cases of cancer of the stomach in one of three groups, the operable, the borderline, and the inoperable. The location of a tumor as shown by the X-ray automatically defines the possibility of resecting the stomach insofar as the stomach itself is concerned, the pars pylorica, pars media, and pars cardiaca being designated the operable, questionable, and inoperable zones, respectively.

Although always very suspicious of malignancy (as approximately 70 per cent of all cancers of the stomach occur in the pyloric end), tumors in the lower end of the stomach are the most favorable for removal. Malignancy may often be recognized in the character and size of the filling defect, but is of no importance in limiting operability for in tumors of this first group operability depends on metastasis, a condition which the X-ray is unable to detect except in the rarest cases and which is not often discovered by other clinical means. Whatever the location or size of a gastric cancer, if it has perforated or if the disease has spread beyond the stomach wall by way of the lymphatics, operation is useless.

Tumors of the second group are classed as borderline cases because they extend so far up onto the stomach wall that resection becomes questionable, especially when allowance is made for the possible presence of a scirrhus cancer which may have invaded the stomach wall more extensively than is shown by the filling defect it produces.

The lesions of the cardiac end of the stomach are definitely inoperable, whether metastasis has or has not taken place. The X-ray examination therefore prevents many useless operations by detecting a growth in the upper third of the stomach. It is of less final value, however, in detecting a growth of the median portion of the stomach as in such cases resection depends, as far as the stomach is concerned, on the skill of the surgeon plus the possibility of metastasis. When the growth is confined to the pyloric end or the lower half, resection is impossible only because of metastasis.

As the likelihood of metastasis seems to increase with the extent and age of the tumor, the earlier a lesion of the stomach is discovered, the greater the patient's chance for cure. Early cancer of the stomach often causes no more than slight gastric discomfort and it is therefore essential in combating the rising death rate of cancer that all persons with any gastric complaint be given early and thorough medical and X-ray examinations. Propaganda which will bring the public as well as the medical profession to realize the necessity for such early examination is the most hopeful means of raising the operability of gastric cancer.

Potter, C. A.: Congenital Pyloric Stenosis, Pylorospasm, and Chronic Appendicitis. *J. Missouri M. Ass.*, 1919, xvi, 380.

Pylorospasm is a reflex phenomenon, while congenital pyloric stenosis is hypertrophy plus reflex. The former must have a nervous origin or an extrinsic, exciting, intra-abdominal etiology. Among the causes of pylorospasm must be considered: (1) cholecystitis; (2) cholelithiasis; (3) duodenal and gastric ulcer; (4) neurosis; (5) tuberculous ulcer; (6) peritoneal adhesions; (7) diverticulitis; (8) syphilis; and (9) appendicitis. With this in mind it is evident that gastro-enterostomy is an unjustifiable procedure in the absence of demonstrable pathology about the pylorus or duodenum.

The author believes that there is a familial tendency to pylorospasm and cites a family which he studied as follows: Case 1, boy 4 weeks of age with congenital pyloric stenosis; Case 2, girl 4 weeks of age with congenital pyloric stenosis; and Case 3, boy 2½ years of age with pylorospasm secondary to recurrent appendicitis.

K. L. VEHE.

Williams, J. T., and Slater, R.: The Condition of the Appendix in Five Hundred Laparotomies on Patients Presenting No Symptoms of Appendicitis. *Ann. Surg.*, 1919, lxx, 535.

The writers have been impressed with the large number of pathologic appendices found in the course of the routine examination of the right iliac fossa during gynecological operations. As cases diagnosed as appendicitis were not admitted to their service, an unusual opportunity was afforded for the study of the appendix during life in patients in whom no lesion of the appendix was suspected.

Five hundred cases were studied, in 167 of which changes were discovered in the appendix. In 64 cases the condition demanding operation was inflammatory disease of the uterine appendages, and in the majority of these it is fair to conclude that the involvement of the appendix was secondary to the right pelvic process. This leaves 103 abnormal appendices which were not associated with any inflammatory process in the pelvis and produced no symptoms.

With few exceptions the lesions of the appendix were chronic in nature. First were those adherent in one or more places without gross changes in the muscularis or mucosa. These were called chronic peri-appendicitis. Second were those with thickening, complete or partial obliteration affecting all the coats and definitely the seat of chronic inflammation. Third were those buried under pericæcal veils.

The writers do not feel that they can definitely interpret the significance of these various lesions found unexpectedly at operation but state that no doubt many of them are quite innocuous. They demonstrate, however, that we are no longer justified in making the diagnosis of chronic appendicitis with the same confidence as in the past.

H. A. McKNIGHT.

Graves, S.: Primary Lymphoblastoma of the Intestine. Report of Three Cases, One with Apparent Recovery Following Operation. A Plea for a Logical Classification of Tumors. *J. Med. Research*, 1919, xl, 415.

Graves states that the opportunity for the study of the gross and microscopic pathology and the clinical course of three cases of lymphoblastoma of the intestine here reported has stimulated an extensive search of the literature on this subject at odd times for the last four years. He believes that the list of 246 cases appended to the article is the most complete ever recorded. Prior to this time the largest collection was that of Crowther published in 1913, which included 122 cases. The three cases reported by Graves make a total of 249.

The research has seemed to Graves almost without end because of the confusion in the nomenclature of tumors. In this report the term "lymphoblastoma" is defined as "a tumor of mesenchymal origin of which the cells tend to differentiate into lymphocytes; that is, into cells of the lymphocyte series," and includes, so far as the literature is concerned, "lymphocytoma," "lymphoma," so-called "lymphosarcoma," and in most cases, the so-called "round-celled sarcoma."

Graves summarizes his paper as follows:

About 246 cases of lymphoblastoma of the intestine have been collected.

To this number 3 new cases are now added. One of these patients was in good health approximately three years after operation. One died seven months after operation with metastases in the lungs and elsewhere. One apparently had recurrence within the abdominal cavity thirty-eight months after operation.

The disease occurs at any age from 1 to 80 years, but is most frequent in the third and fourth decades.

A reliable comprehension of the nature of tumors and their clinical significance, as well as accurate statistics in regard to them, will not be available so long as they are designated by incorrect nomenclature.

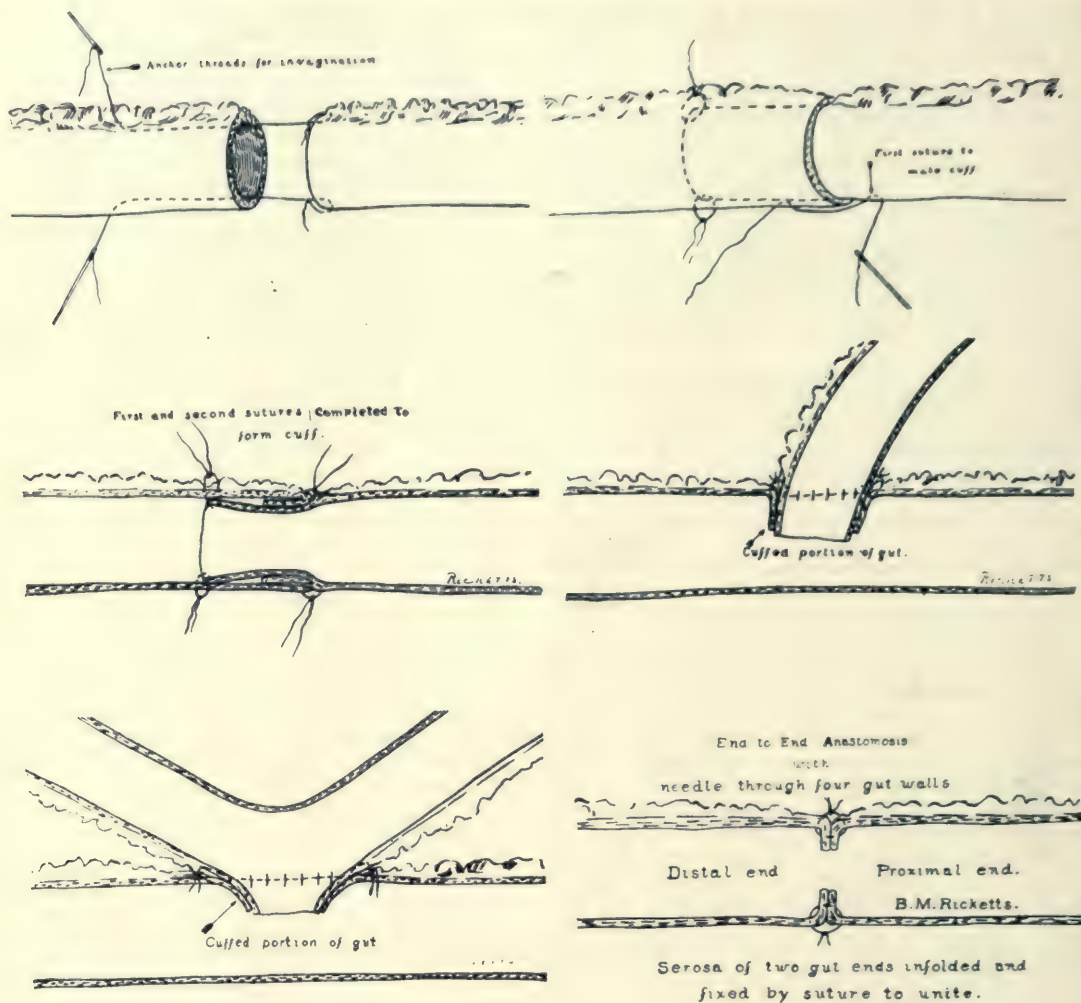
G. E. BEILBY.

Ricketts, B. M.: Intestinal Anastomosis—Newest, Quickest, and Best. *Tr. West. Surg. & Gynec. Ass.*, 1919.

The principle of intestinal anastomosis by invagination, cuff and suture, is probably the simplest, quickest, safest, easiest, and freest from unpleasant complications of any methods, both suture and mechanical.

The nine illustrations presented are given to demonstrate the simplicity and feasibility of the method described not only to those who are familiar with intestinal surgery but to those who wish to become so.

Co-aptation by suture of mucosa to mucosa, muscularis to muscularis, and serosa to serosa is ideal in theory but seldom realized, extremely difficult, and not necessary, as is demonstrated in intussusception with spontaneous severance of the invaginated gut



and when union has been accomplished with mechanical devices.

The author summarizes his conclusions as follows:

1. Nine hours is sufficient time for lymph union.
2. The proximal end of the bowel should extend from 1 to 1½ in. into the distal end in end-to-end anastomosis, though less in lateral anastomosis.
3. Invaginated ends and portions of gut will eventually atrophy without stenosis.
4. Fine round, curved, or straight needles carrying fine silk or linen thread are best.
5. Needles with cutting edges should be avoided.
6. It is not necessary to perforate the gut wall with the needle, though this is of little or no consequence.
7. Interrupted rather than continuous sutures should be used.
8. Catgut should never be employed for this purpose.

9. Sutures should not be drawn excessively taut, but close enough to insure perfect co-adaptation.

10. An extra row of sutures may be applied as a precaution.

11. The method is especially advisable to hasten the completion of the operation. Expedition is always advisable.

Malespine, E.: A Method of Left Iliac Colostomy —the Bridged Anus (Un procédé de colostomie iliaque gauche—l'anus à pont). *Rev. de chir.*, Par., 1919, lvii, 277.

Malespine describes the technique which has been followed by Délore for some years in the formation of an artificial anus.

An incision from 8 to 9 cm. in length is made a finger's breadth above the left anterosuperior iliac spine and parallel to the crural arch and the iliac crest. The obliquus major, obliquus minor, and

transverse muscles are then dissected and the peritoneum opened. This having been done, the iliac sigmoid with its mesentery is brought to the surface through the wound.

In the center of the first incision two T incisions about 4 or 5 cm. long are then made 4 cm. apart and the tongue of skin thus formed is separated from the cellular subcutaneous tissue. The intestinal loop is then held between the thumb and index finger of the left hand, and the small strip of skin, caught with a forceps, is pushed beneath it and sutured to the other edge of the incision. The base of the intestinal loop is fixed to the peritoneum with a few sutures and the loop and skin bridge are tamponed and dressed.

After from thirty-six to forty-eight hours the intestine is sectioned with the thermocautery and dressed. The dressing is renewed each day. The two portions brought to the surface become progressively epidermized. The lower end is irrigated daily.

In seven years' use of this method Délore only once observed a case in which the cutaneous bridge became gangrenous.

After some time cicatrization is complete and the two orifices are from 3 to 4 cm. apart. A receptacle with two completely separated openings corresponding to the two segments of intestine is fixed in place.

The method is employed for a rectal stenosis of cancerous or other type when resection is impossible and the results are better than those obtained in any other way. The author has operated upon fifty patients in this manner within the last seven years and in no case was there any inflammation of the iliac fossa, gangrene of the bridging skin flap, lymphangitis, or erysipelas. The procedure eliminates an important disadvantage of other methods, viz., the passage of feces by the lower end, and thus improves the prognosis.

W. A. BRENNAN.

Chiossone, F.: Ileopelvic Megacolon (Megacolon ileopelviano). *Rev. med. del Rosario*, 1919, ix, 169

This article is a discussion of the work done by Mirizzi on megacolon. Medical treatment and surgery less radical than colectomy Mirizzi considers only palliative. While he does not deny that colectomy is a serious operation, he claims for it a greater number of cures and a lower mortality than have been obtained in this condition by any other method. Mirizzi summarizes his conclusions as follows:

1. There is a normal primary macrocolon which, by the addition of certain acquired factors becomes a megacolon.

2. Megacolon gives rise to sustaining membranes which in the beginning are beneficial but later, due to their irregular contraction, seriously disturb the drainage of the colon.

3. A liberal colectomy is the procedure of choice for the radical cure of megacolon.

4. End-to-end anastomosis is an excellent procedure for cases in which the difference between the ends to be united is not great.

5. The end-to-end suture, while somewhat laborious, is more sure in its results.

6. Appendicostomy and transanastomotic drainage of the colon are very efficient aids to the success of the operation.

M. M. MATTHIES.

Miles, W. E.: Observations upon Internal Piles.

Surg., Gynec. & Obst., 1919, xxix, 497.

"An internal pile consists of a conglomeration of blood vessels in the submucous tissue of the anal canal and of the lower part of the rectum which have become enlarged and tortuous and whose coats have undergone pathologic change, partly hypertrophic and partly fibrotic. Arteries, capillaries, and veins simultaneously participate in this change."

The stages in the development of piles are primary, intermediate, and final, depending upon the constant engorgement and trauma of feces and pinching by the sphincter which cause fibrosis and hypertrophy of the mucous membrane. In long-standing cases fibrosis results in the production of a complete encircling band of fibrous tissue beneath the mucosa in the lower part of the anal canal which the author has termed the "pecten band."

The location of piles on the various arcs of the anal circumference is dependent upon the disposition of the primary and secondary divisions of the right and left terminal branches of the superior hæmorrhoidal artery and upon which of these are involved. The primary piles are always in the same relative position, e.g., the right anterior quadrant, the right posterior quadrant, and the left mid-point of the anal circumference. The secondary piles are additions to these but off-shoots from them, and the formula of location may be stated as follows: Group 1, right anterior; Group 2, right+right posterior+posterior; and Group 3, left posterior+left+left anterior+anterior. The anterior pile is of very rare occurrence. Therefore, it is evident that there are never more than eight internal piles and very rarely more than seven. It is further observed that the full complement is not usual and that those present are often in various stages of development.

The symptom of the first stage is recurrent and often profuse bleeding during defecation. In the second stage the bleeding is less but protrusion of the piles occurs during defecation. This is easily and spontaneously reduced. The third stage is characterized by continuous protrusion unless manually reduced, a marked tendency to recurrence on exertion, and absence of bleeding.

Palliative treatment may arrest the development of piles during their early stages and consists in manual replacement to prevent protrusion and sphincteric pinching. Mild cathartics are also of value.

The indications for operation are copious and recurring hæmorrhage and uncontrollable protrusion.

The author devotes two days to the preparation of the patient for operation. He is confined to bed and given a light diet, and attention is paid to evacuation of the bowels.

The author does a ligation operation which he describes in detail. The sphincter is not dilated but as a first step the pecten band described above is divided, care being taken not to divide the sphincter. Only three ligatures are necessary because secondary piles, when present, are off-shoots of the primary piles and are included in the ligation of the former.

The pile sloughs on the ninth or tenth day and the patient may be up on the fifteenth day. The after-treatment is highly important and is described in detail.

K. L. VEHE.

LIVER, PANCREAS, AND SPLEEN

Barber, W. H.: Choledcho-Enterostomy and Post-operative Dilation of the Bile-Ducts. *Ann. Surg.*, 1919, lxx, 530.

The study here reported comprised experiments on 20 animals, 14 of which were successful, barring the dilation described and the possibility of ultimate ascending infection of the liver. Six were partial or complete failures, due to the harmful compression of the intramural segments of the transposed bile-ducts.

Four of the failures occurred in the thick-walled stomach and two in the duodenum. The stomata were most patent in the relatively thin-walled jejunum.

The following conclusions are drawn:

1. A severed bile-duct too small to suture but long enough for direct choledcho-enterostomy may be re-united to the upper small intestine or the stomach by anchoring it obliquely within the wall of the intestine or stomach.

2. A certain degree of dilation due to the inevitable interruption of the nerve connections during reconstruction of the bile-duct is not incompatible with life. Harmful dilation is associated with retraction of the transposed end, obstructive intramural scar, and deficient epithelialization.

3. The technique described reduces to a minimum the adhesion-forming traumata. The factors tending to prevent retraction and obstruction of the bile-duct are: (1) proper mobilization of the anastomotic intestinal loop; (2) the oblique course of the intramural segment; (3) possibly the dilation of the intraintestinal end; and (4) the anchorage of the bile-duct with due allowance for retraction.

E. C. ROBITSHEK.

Lobinger, A. S.: The Pathologic Indications for Cholecystectomy. *California State J. M.*, 1919, xvii, 401.

Because indications for cholecystectomy are indefinite and because very serious results may follow the removal of the gall-bladder when it is forbidden by the pathologic condition, the author considers the indications for cholecystectomy from the standpoint of the real pathology and the end-results. A short résumé of the literature is also included in the article.

1. Gangrene: The diagnosis should be made early, not late as is the rule, and operation should be immediate.

2. Primary carcinoma: An early diagnosis may be difficult and the liver metastasis well advanced before symptoms arise.

3. Cystic distention: A condition due to stricture of the cystic duct, usually due to an impacted stone, which cannot be successfully treated except by cholecystectomy.

4. Ulceration of the cystic duct from an impacted stone. If merely drainage is used cystic distention invariably develops.

5. Empyema without cholangitis or pancreatitis: The symptoms will indicate whether the liver ducts and pancreas are involved in the septic process. The author's rule is to drain the septic bladder primarily and do a cholecystectomy later as indicated.

6. Contracted gall-bladder with fibrous changes in its walls and destruction of the mucosa without pancreatitis: This condition is frequently due to cholelithiasis, an old empyema, or a ball-valve obstruction by a stone in the common duct. The gall-bladder is a constant source of focal infection and a potential menace for malignancy.

7. A thickened gall-bladder adherent to neighboring organs such as the pylorus, duodenum, and colon: There is no chronic condition of the gall-bladder attended with a more disturbing syndrome nor one more happily relieved by a carefully done cholecystectomy with omental covering to all denuded surfaces.

8. So-called granular or "strawberry" gall-bladder (cholecystitis catarrhalis chronica of Mac Carty): There are so many stages of this condition that in most instances the clinical picture will be the safest guide to a choice between drainage and removal.

Cholecystectomy is contra-indicated in:

1. Simple cholecystitis with or without stone in which the mucosa of the gall-bladder and cystic duct is normal.

2. Cholemia from impacted stone in the common duct. Drainage should be instituted first and the stone then removed.

3. Obstruction of the common duct at the ampulla of Vater causing the bile to back up into the pancreatic ducts. Drainage is indicated.

4. Septic cholangitis. Drainage is the cardinal principle of treatment with cholecystectomy later if indicated.

P. M. CHASE.

MISCELLANEOUS

Mengel, S. P.: Fractures of the Pelvis. *Pennsylvania M. J.*, 1919, xxiii, 70.

The author's experience included 17 fractures of the ramus of the pubes, 12 of the ilium, 14 of both the pubes and ischium, 4 of the acetabulum, 10 of the ischium, 4 of the sacrum, and 8 of three bones. Exact information in regard to the fractures in a number of fatal cases, which in all probability were

the most severe, was unobtainable on account of the patient's condition on admission to the hospital. There were 22 uncomplicated cases, 46 complicated cases, and 1 in which the presence or absence of complications is not specified.

Age seemed to have no influence in the cases reported. Two of the patients were under 10 years of age, ten between 10 and 20 years, twenty between 20 and 30 years, thirteen between 30 and 40 years, ten between 40 and 50 years, and seven over 50 years of age. The ages of three are not given. The youngest was 6 years old and the oldest 69 years.

There were 66 males and 3 females, the large number of males being accounted for by the fact that the majority of the patients were employed in the mines. Twenty-four were miners by occupation, 23 laborers in the mines, and 11 employed in and about mines as motormen, drivers, nippers, runners, etc. There were 3 housewives, 1 business man, 1 soldier, 1 mason, 1 farm-hand and 1 teamster. Two patients were school-boys. The occupation of 2 others is not specified.

Falling rock and coal were accountable for 26 cases, crushing between cars, cars and props, cars and timbers for 33, and miscellaneous causes for 15. In 2 cases the cause was not specified. Among the cases due to miscellaneous causes the fracture was due in 1 instance to instrumental delivery during confinement, in 1 to the explosion of a soda tank, and in 2 to jumping astride a barn door which was covered with hay.

Complications were numerous and often severe. In many instances, owing to the intensity of the fracturing force, the pelvis was crushed and there was extensive damage to the soft parts. Forty-six (66½ per cent) of the author's cases were complicated, and 21 (30½ per cent) of the 69 cases terminated fatally. The severity of the injuries is evident when it is noted that 10 of the 21 deaths occurred within the first seven hours after the accident, 5 between the first and the fourth days, and the remaining 7 between the fourth and the sixteenth days. Five of these cases were operated upon, and death resulted subsequently from sepsis. A large number of the patients sustained severe injuries to other parts of the body. In 5 of the fatal cases there was a compound fracture of the rib and in several the lungs were punctured. One patient had fractures of both femurs, 2 a fracture of one femur, 1 a fracture of the skull, and another a fracture of the spine. Fourteen of the 46 sustained fractures of other bones in addition to the fracture of the pelvis and in a number of instances these were compound and accompanied by great damage to the soft parts.

There was only 1 case of undoubted rupture of the bowel. This patient had suffered extensive injury to the perineum and rupture of the bladder and urethra. All the patients who died, as well as a number of those who recovered, had internal hæmorrhage and symptoms of internal injuries. Twelve (57.1 per cent) of the deaths were due to shock, or internal hæmorrhage, or both. One patient

died from gas gangrene which developed in a badly lacerated and contused thigh and the lower abdomen. The majority of the others succumbed to either exhaustion or sepsis. Disability was constant and complete in all the cases of intrapelvic injury, and shock was marked.

The average time spent in a hospital was thirty-eight days. Fourteen of the patients remained in the hospital for from fifty to seventy-four days, 13 for from forty to fifty days, and 10 for from thirty to forty days.

The time necessary for a complete cure is directly proportionate to the extent of the injury and the displacement of the bones. Too often the patient is allowed out of bed and on his feet before bony union has occurred, with the result that the deformity is increased or he becomes a cripple for life.

Rupture of the urethra and bladder and hæmorrhage are among the most frequent complications. In the author's series rupture of the bladder occurred in 11 cases and rupture of the urethra in 13. In 3 other cases the patients had the symptoms of rupture of the bladder, but being practically moribund on their admission to the hospital the exact condition could not be determined. Roentgen-ray examination usually clears up the case so far as damage to the bone structure is concerned, but gives little or no information regarding the complications. It is therefore imperative that a thorough clinical examination be made at once, even before the patient is sent for X-ray examination.

If the patient has passed urine, or is able to do so, and the urine is clear, it may be concluded that the bladder and urethra have escaped injury. Blood in the urine usually signifies damage to the bladder or urethra, and possibly to the kidney. If the patient is unable to urinate, a catheter should be passed. Usually there is considerable trauma to the perineal tissue, causing discoloration and œdema, and not infrequently a hæmatoma.

If the catheter passes into the bladder with little or no difficulty and clear urine is withdrawn, it is probable that the bladder and urethra are uninjured. If the urethra is ruptured, the catheter usually meets with an obstruction at or near the membranous portion where it often curls upon itself with the escape of blood or blood and serum and perhaps a small quantity of urine intermingled. If the catheter can be passed into the bladder, and no urine, or only a small quantity of urine, urine and blood, or blood alone escapes, there is no doubt that this organ is ruptured.

Injuries to the bladder and urethra are most frequently caused by spicules of bone, but may be due to the fracturing force. The practice of waiting for extravasation of urine in cases of rupture of the urethra is condemned for the reason that extravasation is usually followed by infection, suppuration, and necrosis. Extraperitoneal rupture is usually caused by fragments or spicules of the fractured bones, while intraperitoneal rupture is usually due to the fracturing force upon the organ when it is

distended or filled. In extraperitoneal rupture of the bladder the urine infiltrates through the soft parts in front of, behind, and below the bladder, coming toward the surface through the inguinal canal, the femoral opening, in the perineum, or the prevesical space, from where it may be drained by incisions through the skin.

In suspected cases of rupture of the bladder an exploratory laparotomy should be performed as early after the injury as possible. The one great factor of these cases is thorough drainage, and the earlier it is established the better the chances for recovery. In extraperitoneal tears the wound is often inaccessible to suture. If thorough drainage is established and maintained, the bladder wounds usually heal. Intrapelvic tears of the bladder require careful suturing with drainage of the abdominal cavity as well as thorough drainage of the bladder.

In cases of rupture of the urethra, in which catheterization is impossible, an external urethrotomy is indicated. If the proximal end of the torn urethra can be found, the ends should be brought together and sutured, and a good-sized catheter with two openings should be passed through the entire length of the canal. Usually, however, the

proximal end of the urethral wound is difficult, and at times impossible, to locate. If after a diligent search the end cannot be found, retrograde catheterization should be performed. A mushroom catheter should not be used as calculi or deposits may form and its removal may be difficult or impossible. In one of the author's cases an operation was necessary to remove a mushroom catheter left *in situ* for a period of eight days. The internal administration of some acid will aid materially in acidifying the urine and preventing the formation of phosphatic deposits.

It is remarkable what an important part nature plays in the restoration of the urethral canal if given proper aid. The danger of subsequent stricture in all cases of rupture of the urethra is great, however, and the systematic passing of sounds must be continued for from six to twelve months. Often the passage is irregular and tortuous and the introduction of a sound most difficult, but with patience and perseverance, it can usually be accomplished successfully. Many cases come to operation over and over again because of the patient's failure to heed advice and continue treatment.

The article is concluded with the brief citation of 2 of the author's cases. E. C. ROBITSHEK.

SURGERY OF THE EXTREMITIES

DISEASES OF BONES, JOINTS, MUSCLES, TENDONS. GENERAL CONDITIONS COMMONLY FOUND IN THE EXTREMITIES

Francini, M.: Wounds of the Large Joints (Le ferite delle grandi articolazioni). *Chir. d. organi di movimento*, 1919, iii, 341.

Francini states he has seen several wounds of the joints with involvement of only the synovial membrane which were produced by rifle bullets striking the knee in the parapatellar tissues. The principal feature of these cases was extreme tenderness with effusion into the joint cavity and loss of function. Effusion into a joint cavity may result from injury to contiguous structures not involving the joint such as that caused by foreign bodies in the adjacent ends of bone.

Shell wounds of the joints are in general extensive and associated with injuries to bones, blood vessels, and nerves. The possibility of infection frequently of a virulent type is well recognized. Pieces of clothing are often found in the depths of the wound. The late complications, such as contractures, deformities, and functional disability, demand serious consideration. Francini's work concerned only patients wounded a short time before admission to his front-line hospital. Clinical examination was greatly facilitated by roentgenoscopic and roentgenographic observations which made possible the accurate localization of foreign bodies.

The treatment of recent wounds, aseptic or only contaminated, differs from that of wounds with frank

infection. In simple injuries of the synovial membrane without complications expectant treatment is advised. Aspiration may be done if the effusion is large. In cases of recent shrapnel wounds contaminated with clothing and foreign bodies, excision of the bruised tissue, removal of the foreign particles, and cleansing of the joint are indicated. This is the so-called "joint laparotomy." The wound is closed without drainage. In the frankly infected cases ample drainage is necessary. In cases of severe injury, resection of the joint or amputation is indicated, the type of operation depending on the degree of injury.

After these general considerations, Francini discusses injuries of particular joints, giving the peculiarities in each and the necessary variations in the treatment. Lesions of the knee joint are described in especial detail. A summary of the treatment is as follows:

1. In recent contaminated wounds due to shrapnel or complicated by bone injury, a joint laparotomy is indicated with removal of the foreign body. The wound is then closed without drainage.

2. In recent rifle injuries of the through-and-through type expectant treatment with rigid immobilization is necessary. Large effusions may be aspirated.

3. In recent extensive injuries, typical or atypical, resection must be done. If there is vessel injury amputation is indicated.

4. Infected and suppurating wounds demand ample drainage secured by lateral incisions and

opening posteriorly in to the popliteal fossa. Francini does not use the method of cutting the patellar ligament and laying back the patella. The foreign body should be extracted in all these operations.

I. F. VOLINI.

Martin, T. H.: *The Treatment of the Tuberculous Cripple at the Hospital for Children, Leasowe.* *Brit. M. J.*, 1919, ii, 664.

In the *British Medical Journal* for Oct. 11, 1919, Sir Robert Jones proposes a national scheme for the cure of crippled children. The basis of the plan is as follows:

1. The division of England and Wales into a number of districts.
2. The establishment in each district of: (1) open-air country orthopedic hospitals; and (2) a system of scattered out-patient clinics.
3. The organization of efficient treatment.
4. General co-ordination by a committee working under the Ministry of Health.

In discussing the urgent need of such care and the loss in earning capacity due to the affliction, Sir Robert Jones outlines the financing of the problem and suggests the possibility of taking over the pension hospitals for this purpose when the needs of the crippled soldier will have been met.

Telford in the *British Medical Journal* for Oct. 25, 1919, states that in his opinion the suggestion regarding the use of the pension hospitals is not entirely satisfactory as some of these buildings are situated in regions where the chief agents in the cure of tuberculosis, sunlight and favorable climate, are lacking. He suggests the French plan of large hospitals where the best climatic conditions prevail.

Martin, after referring to the articles mentioned, outlines the work for tuberculous cripples at the Hospital for Crippled Children at Leasowe, Cheshire. This hospital with 200 beds is situated on 14 acres of land exposed to the wind which sweeps the Irish Sea and is ideally placed to meet climatic requirements. Martin describes the structure of the institution and lays stress upon the improvement due to heliotherapy as an integral part of the open-air treatment. Eighty per cent of cases are discharged with the disease arrested. The statistics for 1918 are given as follows:

Discharged, disease having been arrested:

Tuberculous spine, average stay, 617 days...	19
“ hip, “ “ 729 “	25
“ knee, “ “ 438 “	6
“ osteitis, “ “ 319 “	22
“ glands, “ “ 209 “	25
“ peritonitis, “ “ 162 “	25

122

Discharged as improved..... 9

Discharged as incurable..... 9

Discharged with infectious disease (subsequently re-admitted)..... 10

Died..... 17

Total..... 167

The author believes it advisable that a concentration of national effort be made and that larger hospitals be built in areas where it has been proved that cases of tuberculosis progress favorably.

H. W. MEYERDING.

Polettini, B.: *Bone Cysts* (Sulle cisti ossee). *Policlin.*, Roma, 1919, xxvi, sez. chir., 204, 217.

Cystic formations in bone tissues are of various types:

1. Cysts due to parasites, most frequently the echinococcus.
2. Congenital cysts (dermoid, mandibular, etc.).
3. Cysts due to the softening of solid tumors (chondromata, fibromata, etc.).
4. Cysts due to inflammatory processes causing liquefaction of the osseous and medullary tissues such as occurs in granuloma and osteomyelitis.
5. Cysts of as yet unknown etiology and pathogenesis. These are as a rule single cysts with well-defined walls and without either epithelial or endothelial covering. They may contain serous, mucous, or serohæmatic substance or may be empty.

The disagreement among authors is evident from the various compilations of cases taken from the literature. The difficulty of ascribing a clear etiology to these formations is due to the following factors:

1. The relative benignity of the process, which rarely comes to the operating table.
2. The fact that in only a few of the cases surgically treated was the operation sufficiently extensive to allow a complete study of the cyst walls and the neighboring tissues.
3. The lack of a complete histological examination.

The author reviews the various theories regarding the pathogenesis of the condition, i.e., Virchow's neoplastic theory, Recklinghausen's fibrous osteitis, Beneke's traumatic theory, Mickulicz' osteodystrophia, and others.

The author gives very detailed clinical histories of 3 cases in patients 9, 8, and 25 years of age, respectively. Between the first and second were certain clinical and histological resemblances, but between the first and third was complete diversity. In the first two cases the disease was in the trochanteric region of the femur. In the second case the lower third of the femur had been fractured two years before. In both, the cystic production was unique and atrophy and partial destruction of the osseous trabeculae were found with hyperæmia and substitution of connective tissue for the medullary substance.

In seeking the cause the author excludes a neoplastic genesis as well as trauma. While the histological findings might give some suggestion of osteitis, the amount of medullary fibrosis observed in the 3 cases reported was very far from presenting the character of fibrous osteitis.

In the first 2 cases the anatomical and histological findings together clearly indicated to the

author that the cystic formation was the result of destruction of the bone substance by a disintegration and partial atrophy of the bone trabeculae, and that the fibrous walls limiting it were the product of the surrounding tissue.

In the author's third case the histological examination showed osteosarcoma, which put the question of the cause of the condition beyond doubt.

The blastomatous nature of the third case is obvious, but it is difficult to diagnose the nature of the process in the first and second since the alterations in the circumscribing bony tissues showed only those which are common to many processes of absorption, a fact which may explain why such cases have been variously interpreted as osteodystrophia, fibrous osteitis, etc.

From the study of his own cases and of the literature the author draws the conclusion that while bone cysts in any part of the body may be absolutely identical histologically, they may differ greatly among themselves. This indicates that there is possibly a difference in their etiology and pathogenesis.

W. A. BRENNAN.

Jeanne, and Mouchet, A.: A Clinical and Therapeutic Study of Traumatic Lesions of the Wrist (Etude clinique et thérapeutique des lésions traumatiques du carpe). *Bull. méd.*, Par., 1919, xxxiii, 603.

The three most frequent injuries of the region of the wrist are: (1) fracture of the lower extremity of the radius; (2) fracture of the scaphoid; and (3) sub-total retrolunar luxation with or without enucleation of the lunar and with or without fracture of the scaphoid.

When the wrist is swollen and there is deformity of the dorsum it is a case of fracture of the radius or retrolunar luxation. If the latter, the elevation of the dorsum is low and there is an anteroposterior thickening of the wrist itself and immobility with lack of power in the fingers.

If the swelling is localized in the wrist, especially on the outside, the case is a fracture of the scaphoid or a sprain. If the scaphoid is fractured that region projects but the normal relation of the radial and ulnar styloid apophyses is preserved.

If the wrist is sprained there is pain on motion on the radial or anterior surface of the proximal carpal row (scapholunar diastasis).

Isolated fractures or luxations of the carpal bones other than the scaphoid may be suspected from functional trouble in the wrist or localized pain or swelling.

It is most important not to mistake retrolunar luxation as the functional prognosis in such cases is very poor unless treatment is given.

At the present time the clinical diagnosis of carpal lesions is difficult for the majority of practitioners as the examination is very painful and surgical teaching has to a great extent neglected this small complex region. With patience and care, however, a clinical diagnosis of the principal

traumatic lesions is possible, if not at the time of the accident at least after the disappearance of the initial swelling.

The complexity of these traumatic lesions and the difficulty of their examination necessitate the use of the X-ray, but while roentgenography is an indispensable aid it is also susceptible of false interpretation. The projection of the shadow of the tubercle of the scaphoid may be taken for a fracture of this bone, and the normal overriding of shadows in the vicinity of the os magnum taken for a fracture of the os magnum. There is scarcely a region of the body which calls for more care in the interpretation of the X-ray picture than the wrist. Therefore the injured wrist should always be compared with the normal wrist X-rayed in the same position.

W. A. BRENNAN.

FRACTURES AND DISLOCATIONS

Wilcox, A. E.: The Open and Closed Treatment of Fractures; New Methods and New Apparatus Used. *Minnesota Med.*, 1919, ii, 413.

In the author's opinion a simple fracture should not be treated by the open method until repeated and untiring efforts to reduce it, checked and rechecked by the X-ray or fluoroscope, have failed.

Assuming that the closed method is suitable for a certain case, the surgeon's responsibility does not cease after reduction has been accomplished and the fragments are held in place by splints for muscular contraction, decubitus, and the patient's movements must be contended with. To meet these difficulties Wilcox has devised various splints the efficiency of which depends upon extension, adjustability, the patient's comfort, the ease with which they may be applied, the degree to which they facilitate the nursing of the patient, etc.

For certain fractures of the extremities Wilcox has devised apparatus in the form of fracture beds and splints which have proved to be of considerable value. For fractures involving the elbow he uses his cornucopia cast.

Lane plates should be employed in only rare instances, and then only for temporary fixation. The bone graft and Parham band are extremely useful. The latter, the author believes, has not met with the favor it deserves. Its main advantages are that it does not injure the bone, it is rarely, if ever, necessary to remove it, and with the Wilcox carrier it is easily applied. It is recommended very highly to take the place of gut, kangaroo tendon, and bone pegs for holding a sliding graft in place.

The article contains 30 illustrations.

PHILIP LEWIN.

Metcalf, C. R.: Fracture of the Femur; The Application of War Lessons to Civil Practice. *Ann. Surg.*, 1919, lxx, 603.

The Thomas splint, properly applied, gives a good functional and anatomical result in nearly every case of fracture of the femur as it provides adequate sup-

port, fixation, extension, and counter-extension. According to the author, Buck's extension apparatus will become obsolete as soon as the principles underlying the use of the Thomas splint are generally understood.

In intracapsular fractures of the femur the deformity is upward dislocation of the bone and in neglected lesions there is, in addition, persistent adduction of the thigh. To counteract this, a Thomas splint should be applied with traction, the thigh being abducted to 35 degrees and flexed to 30 degrees. After overriding has been corrected the leg should be immobilized with a plaster spica. This is analogous to Whitman's treatment for impacted fracture of the hip.

In a fracture of the upper third of the femur above the small trochanter the upper fragment is abducted, but not flexed, while the lower fragment is drawn upward, inward, and slightly forward. To counteract this, straight traction in abduction is necessary.

In a fracture just below the trochanter the upper fragment is abducted and flexed by the combined action of the glutei and the iliopsoas muscles. It is also rotated outward as the external rotator group more than counteract the anterior portions of the gluteus medius and minimus, the tensor fasciæ femoris, and iliofemoral ligament. The lower fragment is drawn upward and inward by the extensors, adductors, and flexors of the thigh. To overcome this, traction should be made with the thigh in flexion to 30 degrees and abducted until the lower fragment has been brought in alignment with the upper. The knee should be flexed to 25 degrees and the lower fragment supported posteriorly to prevent subluxation. In oblique fractures running downward and inward below the small trochanter, the upper fragment is flexed but adducted by the pull of the adductor muscles inserted near the small trochanter. Traction with the thigh flexed and adducted will bring the lower fragment into alignment with the upper.

In fractures of the middle third of the femur the deformity is due to the fact that the lower fragment is tilted slightly backward by the gastrocnemius. To overcome this, traction with correct subluxation by posterior support is needed and may be obtained with the Thomas splint with "screw pads" on either side of the thigh.

In fractures of the lower third the lower fragment is tilted backward, slightly adducted, and slightly rotated outward by the gastrocnemius and adductor magnus. To correct the deformity traction with the knee flexed between 30 and 90 degrees is necessary. A large support should be made with a firm pad pressing on the posterior surface of the thigh in the area of the lower fragment.

In using a Thomas splint it is necessary to provide a vertical pull on the ring at the tuber ischii and to have a means of elevating the distal end of the splint such as the original Balkan frame or some modification of it such as that introduced by Blake. The knee should be left uncovered and the joint

should be massaged from the beginning of treatment. The splint must be examined daily and adjustments made as often as necessary. Of the methods of traction employed, the use of the non-penetrating caliper devised by Pearson gives the best results with the least trauma, although in most instances the Savenay adhesive method without any bony extension is very successful. GATEWOOD.

Campbell, W. C.: Fractures of the Neck of the Femur. *Ann. Surg.*, 1919, lxx, 600.

The author offers a comparative study of 116 cases of fracture of the neck of the femur. Seventy of these were treated by him personally. Most of the patients were past 60 years of age. Five died of uræmia, pneumonia, or anæsthesia. There were 29 fractures of the neck proper or so-called "central fractures." In these cases treatment by the Whitman method gave good functional results in 24 instances and failed in 4. In 1 case the result is unknown. Forty-four ununited fractures were observed, all of which were of the central type. Of these old fractures, 24 were operated upon, 7 by the wire-nail method, 15 by the tibial graft method, and 2 by merely freshening the surfaces. The bone-graft method gave the best results, 11 of the 15 operations being successful. Grafts were not used when marked atrophy of the head was apparent.

The author believes that the mortality is less in cases treated by proper management in a plaster cast than in those treated by any other method. He applies a cast from the nipple line to the toes. The patient's position is changed every two hours for the first week and thereafter every three hours. Very old or very feeble patients are placed in a special chair and encouraged to eat their meals in this position. Walking on crutches is allowed at the end of three months, but weight-bearing is not permitted for at least six months.

The Whitman method as employed in the author's cases consists of forcible abduction to the limit and extension and moderate internal rotation. In 3 of Campbell's cases, however, it was slightly modified in order to make it possible for the patient early to assume a sitting posture. GATEWOOD.

Criado Aguilar, F.: The Treatment of Fractures of the Femur (Tratamiento de las fracturas del femur). *Arch. de ginec., obst. y pediat.*, 1919, xxxii, 221.

While in the treatment of fractures of the femur it is necessary to keep up continuous extension without variation, it is not always possible to do this satisfactorily with the methods commonly used, especially in the cases of children.

Criado claims that he obtained the desired result with a plaster bandage which he used on a child 7 years of age who had an oblique fracture of the middle of the shaft of the femur. He describes this bandage and the method of applying it as follows:

The child is laid in the supine position on a table covered with a mattress. The bandage is then

applied first to the pelvis over a 1 cm. layer of cotton and over a gauze compress on the perineum between the anus and the scrotum held in place by folds of the gauze sewed from above downward at different points. It is applied in such a manner that it encircles the pelvis completely, including the perineum and the anus, but does not cover the external genitals. It extends from a few centimeters above the iliac crest to the upper part of the thigh but must not encroach upon the point of fracture. The affected limb is then placed in a comfortable position and the leg and foot, with the exception of the toes, are covered with cotton and wrapped in the plaster bandage to just below the knee.

If an anæsthetic is necessary it should be given at this point after the bandage has been applied. The fracture is then reduced. While the surgeon adjusts the fragments one assistant makes extension by pulling on the bandage of the leg and another makes counter-tension by holding the bandage of the pelvis. When the normal length has been obtained and the limb has been placed in good position, a horizontal line corresponding roughly to the level of the anterior superior iliac spine is drawn with ink on the pelvic bandage and another in the middle of the upper surface of the leg bandage. The distance between the two lines is measured with a ruler or a strip of thick paper which someone is assigned to hold 3 or 4 in. away to see that the distance between the lines does not vary while the plaster bandage is being applied to the thigh and the knee. This portion of the bandage is attached to the pelvic and leg portions with plaster. When the bandage has hardened a small opening is cut over the anus. Another opening is cut over the heel to prevent pain from the weight of the foot.

The author maintains that by the extension and counter-extension produced by its rigidity this mechanism will maintain the position and normal length of the limb constantly and uniformly. No harm results if the patient moves, and after the first few days walking on crutches may be permitted unless there are definite contra-indications.

M. M. MATTHIES.

SURGERY OF THE BONES, JOINTS, ETC.

Vignard, P.: An Early Treatment of Acute Osteomyelitis (Un traitement précoce de l'ostéomyélite aiguë). *Presse méd.*, Par., 1919, xxvii, 501.

When the exact localization of osteomyelitis is not definitely known, when there is no clear abscess, and when the œdematous infiltration covers a much larger zone than is really involved, it is difficult to determine the course of treatment. When the condition involves the region of the joint it is very hard to avoid the diagnosis of suppurative arthritis, and opening a joint in the neighborhood of suppuration is particularly dangerous. The same is true even when acute osteomyelitis near the epiphyses causes a reaction in the joint. Complete retrogression may follow a simple puncture.

In fifteen years of surgical experience the author has had several deaths in such cases owing to the lack of definite knowledge regarding the process. He finally hit upon the expedient of trying a fixation abscess. The results were very favorable. He has used this method also in cases of osteomyelitis in which the abscess has already clearly collected. The fixation abscess is obtained by injecting 2 or 3 c.c. of turpentine, the injection being repeated if there are no signs of inflammation after twenty-four hours.

W. A. BRENNAN.

Platt, H.: The Treatment of Flail Joints. *J. Orthop. Surg.*, 1919, i, 667.

Platt discusses the treatment of flail shoulder and elbow joints dependent upon an actual loss of bone, and states that in his opinion a fair degree of stability or a sound ankylosis have often been prevented because the importance of correct postural fixation of the limb in the intermediate stages has not been realized.

The author's cases of flail shoulder usually showed section of the humerus below the tuberosities and direct involvement of the deltoid muscle, but the acromion, the coracoid, and the glenoid fossa were intact.

Treatment includes first a course of preliminary physiotherapeutic training of the deltoid and scapular muscles with the arm maintained on an abduction splint. Operation is done in two stages. The first stage consists of the excision of the whole block of scar tissue and possibly reconstruction of the deltoid insertion. The second stage is designed to produce fixation, either by a classical arthrodesis or the reconstruction of the humeral head. The author decidedly prefers the latter. He removes a mallet-shaped graft from the tibia, drives the handle of the graft into the medullary cavity, and brings the wide upper end into contact with the glenoid cavity. By this method good functional results have been obtained.

The cases of flail elbow joints showed the humerus sectioned above the condyles, the olecranon missing, but the radial head often intact. In these cases also preliminary physiotherapeutic treatment is necessary with the elbow in acute flexion and the bones approximated. True bone ankylosis is very difficult to obtain. The author prefers to bind the bone ends together by the insertion of one or two long stout slings from the fascia lata drawn through holes drilled in the three bones. The limb is slung up in 45 degrees of flexion, and a course of after-training of the same character as the preliminary treatment is carried out.

R. G. PACKARD.

Orr, H. W.: The Surgical Treatment of Infections of the Knee Joint. *Surg., Gynec. & Obst.*, 1919, xxix, 492.

This article deals with acute infections of the knee joint. These may be divided into the following four principal forms:

1. Acute infection with the formation of pus, but with no opening into the joint.
2. A compound injury to the joint, but with no damage to the bone.
3. A compound fracture of the femur or tibia involving the joint.
4. Late conditions of either Form 2 or Form 3 with general sepsis.

Each of these forms requires a different method of treatment.

Cases of acute infection with the formation of pus require adequate drainage, usually lateral incisions, and the Willems method of treatment by active movements. The Willems method may be used also in certain cases belonging to Group 2 but only for acute infections with the formation of pus which are seen early, in which there is no damage to the bones, and in which the damage to the articular surfaces is slight.

One of the most difficult groups of cases for the surgeon are those belonging to Group 4. In general it may be said that in compound injuries to the knee joint with damage to the upper end of the tibia or the lower end of the femur or both, in which serious infection occurs at the time, it might be better, as a rule, to amputate at once. The extremity which can be saved is in the large majority of cases not a useful one and the risk to life is very great.

In the cases in which an effort has been made to preserve such an extremity and in which general sepsis recurs with accumulation of pus in the knee joint and pockets up and down the leg and thigh, amputation is not always the first thing to be considered. Life may be saved by preliminary adequate drainage.

One method of draining is the method described by Abbott. According to this procedure a 4-in. incision is made along the inner and posterior border at the upper end of the tibia and thence into the space under the insertion of the popliteus into the knee joint. Another method consists of reflecting the patella. If the patient is carried through his most acute septic period by drainage, amputation, if necessary, may be done later. In all of these cases adequate postoperative splinting is essential.

E. H. POOL.

Campbell, W. C.: Fibula Transference for Tibial Defect. *J. Orthop. Surg.*, 1919, xvii, 625.

The author reports three cases of gap defect in the tibia in which to bridge the gap he used the upper end of the fibula in addition to a free bone graft. The upper end of the fibula having been disarticulated from the tibia, its head was denuded of cartilage and placed in a cavity made for it in the proximal fragment of the tibia. A free graft from the opposite tibia was then inserted, usually a little later as a second stage of the operation.

Greater stability and more lengthening is obtained by utilizing the fibula than is possible when only a free bone graft is used. The fibula also furnishes additional blood supply to the tibial fragments, thus

hastening union so that in eight weeks the leg is stable and no false motion is possible.

In 1905, Huntington, and in 1907, Stone used the fibula to repair defects in the tibia of the same side, but without the additional free bone graft. The author's method makes success more certain and precludes the luxation of the fibular head and consequent varus tendency of the leg which is common in these cases.

The necessity for a two-stage operation is emphasized. W. A. CLARK.

ORTHOPEDICS IN GENERAL

Frauenthal, H. W., and Ralston, F. V.: Painful Feet. *Med. Times*, 1919, xlvii, 280.

Painful foot is due to three types of causes: static, infectious, and circulatory. When due to static conditions, whether the foot is flaccid or rigid, it is not always the result of relaxation of the muscles which lets down the longitudinal arch, but very often caused by a breaking down of the anterior arch which may lead to an anterior metatarsalgia. In such cases weakness of the feet may be traced back to childhood and a lack of tone or some debilitating disease such as scarlet fever. In adults the etiology may be the occupation. In these cases the anterior and posterior tibial muscles are relaxed and weakened, the transverse arch is falling, and there is pain at the metatarsophalangeal articulations, particularly of the third and fourth toes, with impingement on the nerve causing Morton's neuralgia. Often there is pain also at the internal lateral ligament of the knee, and sometimes at the hip joint. The main etiological factor is the type of shoe used, which usually has a narrow vamp, an exaggerated point, and a high heel.

The treatment of these static conditions includes foot exercises similar to those on the Zander foot apparatus and the wearing of a proper shoe with a straight inner line, broad toes, and a heel with a broad base. A metal support or plate is inadvisable, but if necessary some felt padding may be employed, the shoe tilted, and electricity and massage used.

In a hospital for deformities and joint diseases, more than 50 per cent of the cases of painful feet were due to an infection which resulted in weakness of the muscular and ligamentous structures or chronic involvement of the soft tissues and periosteum. The authors report 8 cases of focal infection in which pyorrhea, tonsillitis, hemorrhoidectomy, non-gonorrhoeal leucorrhoea, gonorrhoea, tuberculosis, and syphilis were the primary causes.

Under circulatory conditions responsible for painful foot emphasis is placed upon obliterating endarteritis which is most frequent in Russians, Poles, and Galicians, and causes subjective symptoms of intense pain in the toes, feet, and legs which is augmented by walking or the pressure of the shoes. The objective symptoms include an abnormal gait, congestion and cyanosis of the feet, diminution of thermal sensitiveness, a clammy skin, and absence

of pulsation or enfeebled pulsation in the dorsalis pedis and posterior tibial arteries. Later there is atrophy with darkening of the skin resembling gangrene. No cause is known. In discussing the treatment the author states that amputation

should not be done before a thorough trial has been made for a prolonged period of time with white light, nitroglycerine, and tincture of echinacea as in many cases patients have responded to these measures.

R. G. PACKARD.

SURGERY OF THE SPINAL COLUMN AND CORD

Plaggemeyer, H. W.: Shell Fractures of the Spine; With Observations on the Kidney and Bladder Function. *J. Am. M. Ass.*, 1919, lxxiii, 1599.

Plaggemeyer reports 17 cases of shell fracture of the spine observed at the Walter Reed General Hospital with particular attention to the kidney and bladder function. Every patient observed had been catheterized abroad, all were infected, and many demanded catheterization.

In all cases there was a history of complete retention following the injury. The onset of incontinence varied from twenty-four hours in 5 cases to six months in 1 case. In the latter instance, however, the patient had an inlying catheter when admitted, and 4 others, whose histories were given as three, four, five, and six weeks respectively, had apparently been catheterized as a routine measure.

The site of the lesion varied from the sixth cervical to the cauda equina, the lumbar cord being the favored site in 9 cases, the dorsal in 5, the cervical in 2, and the sacral in 1.

Rectal involvement was general and ran a course symptomatically parallel to that of the bladder. Sexual desire and ability were absent in all.

In 11 cases after consultation cystoscopy was performed with no untoward results, every care being taken to preclude further infection. The picture was practically unvarying, and the findings might be summed up in a composite group:

1. Normal or hypertonic contraction of the external sphincter.

2. Complete relaxation of the posterior urethra, the floor definitely falling away from the roof. The verumontanum was plainly seen, in most cases appearing to lie in the floor of the bladder. The internal sphincter was almost wholly obliterated as such, though its site was marked by a slight convexity in its anteroposterior aspect.

3. The trigon in 6 cases was definitely atrophic in appearance, 1 case presenting a right lateral congestion sharply demarcated in the midline. Four cases gave a picture of raised trigon, the elevation being especially marked at the interureteral ridge and being more apparent than real owing to the bas fond lying posterior to it.

4. Generally the ureteral orifices were within range of the normal as to position, excursion, and mobility.

5. Trabeculations were found in every case, gigantic in size, as a rule transverse and coarse on the floor, rather evenly distributed on the lateral walls, and having their greatest complexity on all the surfaces surrounding the vertex.

6. There was no case of diverticulitis and no case of trophic ulceration of the bladder.

7. Nearly all the bladders had a general vasomotor disturbance which was particularly marked on the floor and characterized chiefly by irregular, ill-defined areas of venous congestion.

8. The level of the lesion apparently had nothing to do with either the functional activity of the bladder or the excreting power of the kidney. The most marked evidence of neurotrophic bladder disturbance was found in a case in which the lesion involved the seventh cervical and the first three dorsals only.

9. Hyperhidrosis on forcible distention of the bladder was not discovered in any case, though in every instance except one there was a previous history of zonal hyperhidrosis confined within the segmental limits of the thoracolumbar outflow and always below the segment involved.

10. Every patient had residual urine in varying amounts, though there were intervals when some of them gave every evidence of true incontinence. The residual urine obtained varied from 0 to 810 c.c., the mean average being 180 c.c.

The picture of residual urine being present even in cases in which at times there seemed to be true incontinence during which the bladder automatically emptied itself, the possibility of back pressure was considered. Retention was studied by the estimation of the urea nitrogen, the non-protein nitrogen, and the creatinin and uric acid in the blood, while excretion was determined by means of phenolsulphonaphthalein and the determination of the urea nitrogen, sodium chloride, uric acid, and creatinin in milligrams per pound of body weight in carefully collected twenty-four-hour specimens of the urine.

As a result of this investigation it was found that a high urea nitrogen, high non-protein nitrogen, and persistent normal creatinin content in the blood was balanced by a comparatively low renal concentrating power for urea, a low output of creatinin in twenty-four hours, and a low uric acid output. Colaterally the colorimetric curve rose as a whole where the retention curve fell.

It was at first assumed that the retention phenomena observed were caused by back pressure leading to hydronephrosis. Necropsy in the case of a patient for whom values of 103 mg. of urea nitrogen and 68 mg. of non-protein nitrogen were found before death, however, showed no evidence of hydronephrosis. In this case the phenolsulphonaphthalein test was fairly high, 20 and 45

per cent, but the first hour was less than half the second, and the time of appearance was twenty-one minutes (gluteal). The average residual urine was 135 c.c., the bladder being relaxed, and a bullet being lodged in the spine near the ninth, tenth, and eleventh thoracic vertebrae which would certainly be expected to involve the ureters.

It is the author's belief that if hydronephrosis supervenes, it must be at a much later stage than in the cases he observed. He ascribes the retention to several other factors in addition to a possible hydronephrosis. When the cases were first seen the blood-urea nitrogen was inordinately high, first, because of the tremendous tissue waste resulting from neurotrophism, as evidenced in the body weight and general appearance of emaciation, and second, because in the attempt to avoid too frequent catheterization, these patients, while abroad and in transit, were not permitted free access to water until they were almost completely dehydrated. Consequently, with a low fluid content in the blood stream, the solid content rose proportionately. Added to this was the neurotrophic hyperhidrosis which occurs in all such cases and further increases the concentration. Still further augmenting it was the steady addition of tissue nitrogen, the whole being offset by a recalcitrance on the part of the kidneys to concentrate adequately for excretion owing to infection or inhibition of neuropathic origin.

It is true that with free access to water, daily massage, general attention to peripheral stimulation and the re-establishment of normal skin function and particular attention to stimulation of peripheral areas segmentally involving the inferior mesenteric and hypogastric plexus, the picture changed markedly. The urea nitrogen and the non-protein nitrogen decreased month by month and the kidney excretory and concentrating capacity increased absolutely if not relatively for any given point of the curve.

As to the early care of these cases Plaggemeyer suggests that if possible there should be entire abstention from catheterization for catheterization means sure infection and the replacement fibrosis following renal infection is more lasting and more dangerous than a hydronephrosis, even granting that in such cases there is a permanent hydronephrosis. If intervention is necessary there is no contra-indication to the use of the aspirating needle until incontinence is established.

Strange to say, these bladders do not rupture, and as they are insensate, no discomfort is experienced. The extent of their dilatation can be readily determined, and if by judicious use of extravascular stimuli the onset of incontinence can be established early without the use of the catheter, the patient is further protected from the otherwise inevitable infection.

G. W. HOCHREIN.

SURGERY OF THE NERVOUS SYSTEM

Jones, F. W.: Voluntary Muscular Movements in Cases of Nerve Injuries. *Lancet*, 1919, cxcvii, 907.

Much has been learned from the vast amount of material made available by the war of those two great factors of life, sensation and movement. Many of our opinions have been changed hastily, while others have been changed as a result of the gradual accumulation and observation of unassailable clinical facts. It should therefore be possible to review critically the data presented and the changes of thought that occurred during the war period.

There has been more progress in our knowledge and understanding of the physiological basis of sensation than of the principles of muscular movement. The neurologist is trained to think in terms of the central nervous system, while the orthopedic surgeon naturally thinks in terms of peripheral motor nerves.

The quality of sensation lodged within the gray matter of the postcentral gyrus consists in a discriminative appreciation of the spatial relations of a part. Within the so-called motor area of the precentral gyrus is lodged a voluntary power to initiate an alteration in the position of a part, the spatial relation of which is appreciated in the post-Rolandic area. This power of altering the spatial relation of parts is conferred by the agency of the contractile muscles, and since these muscles react in

response to the volition of spatial alteration, we are accustomed to misname them "voluntary muscles."

Muscles are voluntary only to the extent to which their voluntary action is appreciated by the cortex. The various ways in which muscle groups react to carry out a volition or spatial alteration of a part are well known and form no part of the advances made during the war.

Most muscles may act in four capacities: (1) as prime movers, (2) as antagonists, (3) as synergics, and (4) as fixation muscles. Probably in teaching, too much prominence has been given to the prime moving action of muscles and too little to their work in the other three capacities. In emergency war surgery little regard could be paid to muscle integrity, but such should not be the case in our home operating room. By damage to, or destruction of, a muscle, not only is a prime mover destroyed but an antagonist, synergic, or fixation muscle is lost to some other muscle group. Under the most favorable circumstances, damaged muscle tissue has only a minimum reparative power, yet it is often ruthlessly destroyed by the surgeon. Of all the muscular activities, only that of prime mover fulfils the conception of a voluntary muscle performing the task set by the will. Of their other actions we are not conscious nor can we call forth or alter their activities.

In tendon transplantations, flexors may become extensors by volition, acting as prime movers, but

this action is not accompanied, as is normally the case, by the antagonistic action of the untransplanted flexors. Thus, the muscle of a transplanted tendon acts in a normal way as a prime mover, but does not perform the other normal muscle activities. For example, when the flexors of the wrist are transplanted so as to become extensors, the normal synergic action of hyperextending the wrist on strong flexion of the fingers does not occur; on the contrary, with strong flexion of the fingers the wrist also becomes flexed, thus depriving the flexors of some of their power. Accordingly, one may say that these cases always look a little better than they really are when considered as functional results, for the grip with a flexed wrist is never very strong.

In the examination of nerve injuries during the war the clinician was often led astray by a false conception of muscle action and sensory loss as text-book teaching has been that muscles act only as prime movers and that the sensory loss would correspond to the anatomical distribution of the nerve. In these cases, instead of an entire loss of function, as would be expected from a text-book description, it is found that the loss of power is made good by other muscles acting as agents of cortical volition in performing actions not normal to them. For this reason the loss of motion appears to be astonishingly small when the function of the muscles supplied by the injured nerve are considered as prime movers. The failure to appreciate the principle of voluntary movement has frequently led to very false estimates of recovery after some form of treatment has been carried out.

Many instances of anomalous nerve supply have been reported because motions were possible that from orthodox teaching were considered to be inconsistent with the findings at operation. These reports should be looked upon critically and when thoroughly investigated it will probably be found that the number of cases in which anomalous nerve supply accounts for an unexpected motion will be reduced to a minimum. Possibly these so-called anomalies can be explained by the influence of the cortex in producing voluntary movements. In such cases the movement ordinarily produced by the action of one muscle is brought about by the voluntary action of another muscle or muscles. In muscle re-education there is danger that the patient will learn to employ normal muscles to perform the function of those paralyzed, thus executing trick movements. The surgeon must be on the alert, therefore, not to be deceived in gauging the progress or the indications for operative interference in these cases.

W. O. ORT.

Elsberg, C. A.: The Technique of Nerve Suture and Nerve Grafting. *J. Am. M. Ass.*, 1919, lxxiii, 1422.

For suturing nerves Elsberg uses fine Carrel needles with very fine silk and effects the union with perineurial and epineurial stitches. After the nerve ends have been brought into their proper relation

by the attachment of mosquito clamps to the sides of the nerves so that the arrangement of the funiculi in both ends is made visible, one, two, or three fine perineurial stitches are passed, the number depending on the arrangement and number of the funiculi. It will usually be found that the epineurium has retracted, and if the needle and suture material are sufficiently fine no special difficulty will be encountered in passing the stitches through the perineurial tissue between the funiculi.

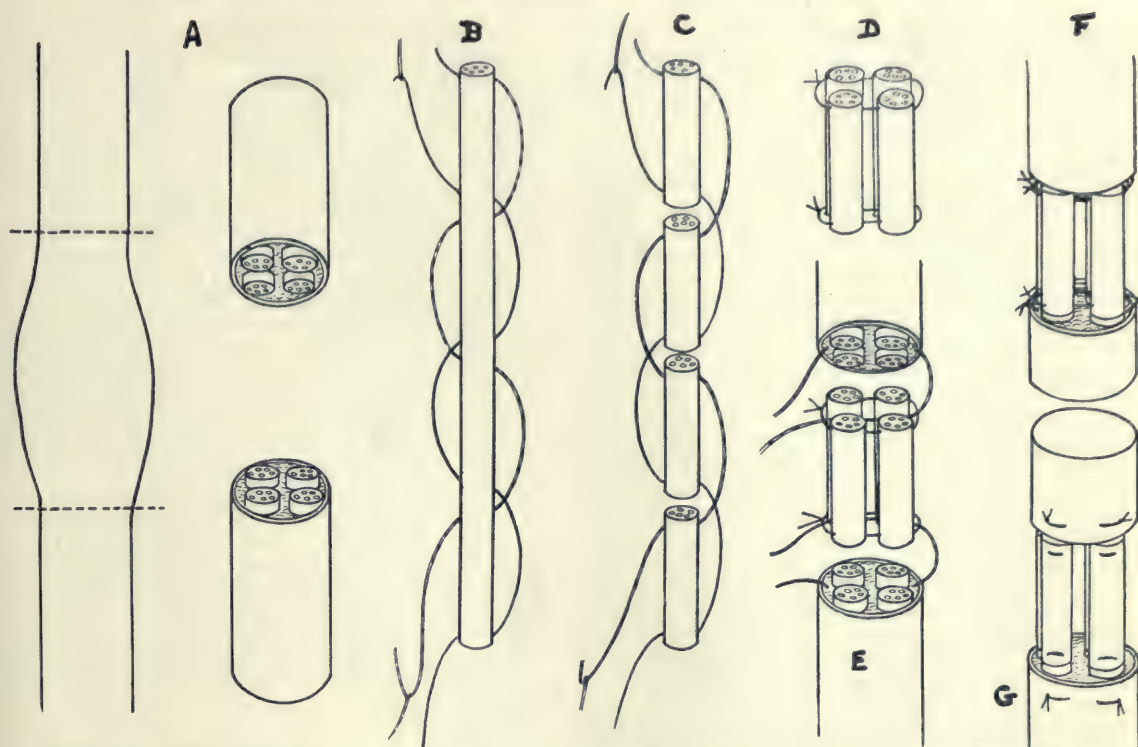
The author has found it best to hold the needles with fine mosquito forceps rather than with the fingers, and to grasp the needle with the forceps about 0.5 cm. from its point. When the nerve consists of a number of small funiculi, two or three of these perineurial stitches are necessary, but when it is made up of from two to four large funiculi two stitches are usually sufficient. If the sutures are well placed with due regard to the nerve pattern, a fairly accurate apposition of the ends of the funiculi is possible. While the apposition would be more perfect if the sutures were passed through each one of the large funiculi, such a suture is inadvisable on account of interference with a certain number of nerve fibers which such an end-to-end funicular suture would entail.

All of the perineurial sutures should be passed before they are tied, and when tying them care should be taken that they just bring the funiculi into apposition. If they are tied too tightly, the funiculi are bent at their ends and the resulting approximation is poor.

After the perineurial sutures have been tied, the mosquito forceps may be removed. The epineurial stitches should be placed so as to approximate the free borders of the epineurial sheath exactly. The author believes that the best approximation can be obtained with mattress sutures which are much less apt to tear out than simple sutures. From four to five mattress stitches are sufficient and each suture is left long for traction while the succeeding one is being passed. In some cases in which he has sutured the sciatic nerve Elsberg has made a continuous running suture of the epineurium as in the Carrel technique for blood-vessel suture.

After having determined the length of the defect to be bridged over by the graft and the number of strands that will be required, the author exposes one or several cutaneous nerves and carefully dissects them out until they remain attached only at their upper and lower ends. Two sutures are then passed in and out of the nerve at measured distances.

Assuming, for example, that the graft is to be 7 cm. long and is to consist of three strands. The one suture (A) is passed through near the attached upper end of the freed nerve, from its inner to its outer side, a loop being left loose. The needle is then passed through the nerve from the outer to the inner side a little more than 7 cm. from the first point, a loop being again left loose and the needle passed through the nerve from its inner to its outer side at



The cable graft: A, bulb resected and ends of nerves exposed; B, sutures passed through the cutaneous nerve used from cable graft; C, nerve divided into segments; D, cable graft ready for transplantation; E, sutures passed through ends of cable graft and ends of nerve; F, sutures tied; G, perineurial sutures tied. (Diagrammatic.)

Elsberg, C. A.: The Technique of Nerve Suture and Nerve Grafting.

the same distance from the last point. The needle is then laid aside and a second needle and suture taken. This needle (B) is passed through the lower end of the nerve, from its outer to its inner side, a little more than 7 cm. from the point of emergence of Needle A. A loop of the suture is left loose and the needle again passed through the nerve from the inner to the outer side at a point 3 mm. above the point of emergence of Suture A. Finally the needle is passed through the nerve from its outer to its inner side 3 mm. proximal to the next point above. The points at which Suture A has passed through the nerve correspond to the upper ends of the graft, and those through which Suture B has passed correspond to what are to be the lower ends of the strands. After the loops have been carefully arranged the nerve is cut with fine scissors or a fine scalpel 1 mm. above the beginning of A, 1 mm. below the beginning of B, and between each two points through which Sutures A and B are passed, apart in the nerve. An assistant then grasps the two ends of Suture A and the operator the two ends of Suture B. When traction is made the strands are drawn together. Each suture is then loosely tied. Suture A brings all of the upper ends of the strands together, and Suture B all of the lower ends.

After the cable graft has been thus made, it is transferred to its place between the divided ends of the main nerve and sutured. E. C. ROBITSHEK.

Sargent, P., and Greenfield, J. G.: An Experimental Investigation of Certain Materials Used for Nerve Suture. *British M. J.*, 1919, ii, 407.

In the authors' investigation an endeavor was made to ascertain which of the many materials in general use as nerve sutures is least apt to produce harmful reaction in the delicate tissue of the nerve. Previously upon histological examination of a large number of nerve lesions due to gunshot wounds they had noted that the presence of any foreign body in the substance of the nerve was liable to produce great hyperplasia both of the connective tissue and of the neurilemmal cells.

The sciatic nerve of rabbits was used in this experimental study, and the suture materials employed were as follows: thirty-day chromic gut, No. 00; Stiles's linen thread No. 160; Stiles's fine linen thread, No. 160, waxed with Horsley's bone-wax; Japanese silk No. 00; Japanese silk No. 00 waxed; Japanese gut; tanned gut thirty-day No. 00; twenty-day chromic gut No. 00; plain iodized gut No. 00; twenty-day chromic gut No. 0; plain gut No. 0.

Except in one case the sutures were placed through the substance of the nerve without dividing the nerve and making an anastomosis. The animals were sacrificed after a period of twenty-one days or longer, and the nerves removed and stained by Van Gieson's method for celloidin sections.

Two distinct histological changes are present to some degree in every experiment:

1. Mesoblastic cells: The early reaction is on the part of the mesoblastic cells. The circulating lymphocytes and hyaline cells and, in the case of the more irritating suture materials, the polymorphonuclear leucocytes also, take a part in the reaction from its earliest stages. Very soon afterward there is a proliferation of the endothelial and fibroblastic cells. Both these reactions vary in amount according to the nature of the suture material and seem to be especially marked when the catgut employed has been prepared with chromic acid. They are very slight when plain linen thread and silk are used, but when these materials have been waxed with Horsley's bone-wax, a narrow zone of mesoblastic reaction appears.

2. Cells of the neurilemma sheath: The other form of reaction, that of the cells of the neurilemma sheath, comes on at a later date. It is probably inevitable and due as much to the damage inflicted on the nerve as to the presence of a foreign body. No doubt, however, the suture stimulates the neuroma formation and leads to the appearance of the large giant cells which seem to arise from the cells of the neurilemma sheath.

The authors feel that the formation of a neuroma at the site of the suture is unavoidable whatever the material used so long as any damage is done to the nerve fibers. It will be of limited extent, however, if fibroblastic reaction is avoided, and it will be healthy neuroma tissue in the sense that, if no lasting source of irritation is left, it will be able to transmit useful functioning nerve fibers. It is stated further that the materials which caused the least fibroblastic reaction were plain linen thread and silk but that both of these, when waxed with Horsley's bone-wax, gave rise to more small-cell infiltration than when used plain. The disadvantages of any suture material are increased when it is passed through the whole thickness of the nerve in the form of a tension suture as this will tend to produce an intraneural neuroma at a greater distance from the suture line both above and below, thus making an additional obstacle in the pathway of the regenerating axon.

The conclusions drawn are as follows:

1. While plain thread or silk sutures give rise to no irritation, they are relatively unabsorbable.
2. Plain sterilized or plain iodized gut are of value by reason of their rapid absorbability, but their low degree of tensile strength and their slightly irritating nature counteract these advantages.
3. Japanese silkworm gut has great tensile strength, and in its rate of absorption and the reaction it causes holds a place midway between Groups 1 and 2.
4. Chemical antiseptics should be avoided in all suture materials.

A. W. ADSON.

MISCELLANEOUS

CLINICAL ENTITIES—TUMORS, ULCERS, ABSCESES, ETC.

Hertzler, A. E.: *The Prognosis in Hyperthyroidism.* *Surg., Gynec. & Obst.*, 1919, xxix, 462.

All of the author's operative cases have shown evidence of organic or tinctorial change in the gland which would seem to indicate that the product is always abnormal. If the purpose of the thyroid is to produce iodine, then certainly the gland is in a "hypo" rather than in a "hyper" state for only a small proportion of iodine is found in the pathologic gland as compared with the normal gland.

As a very general proposition hyperthyroidism may be regarded as a self-limited disease. Very probably it is merely a spontaneous obliteration of the pathologic process. Gland in hand the surgeon should be able to say which is the diseased and which the normal part. In order to appreciate the degree of spontaneous recovery possible, one must follow the patient for many years. To determine the subsequent state of our ex-patients we must examine them ourselves.

Hyperthyroidism in running its cycle is subject to certain complications and accidents which must be taken into account, and the fundamental factor in

the treatment must balance itself against this tendency to complications. In order to reach a clinical classification the author considers each patient as belonging to one of the following categories: (1) those that recover without operation; (2) those that are most apt to be cured by operation; (3) those which operation will not cure but will benefit; (4) those who would not be benefited at all by operation or for whom operation is too dangerous.

The following groups and subgroups are discussed:

1. Adolescent type: (1) stable nervous system without other lesion; (2) stable nervous system with other lesion; and (3) neurotic.
2. Adult type: (1) normal nervous state without associated disease; (2) normal nervous state with associated disease; and (3) abnormal nervous state.
3. Typical exophthalmic goiters: (1) with associated lesions; (2) without associated lesions; and (3) localized changes in the gland.
4. Secondary hyperthyroidism: (1) with associated lesions; (2) without associated lesions; and (3) with pronounced myocardial changes.
5. Atypical type: (1) acute classical hyperthyroidism; and (2) acute masked hyperthyroidism.

Each of these groups is discussed and case reports are given.

In the first and second subgroups of Group 1, in which there is a localized enlargement, the results of operation are immediate and brilliant, particularly if there is encapsulation. Those of the second subgroup usually remain labile, and a repetition of the exciting cause may precipitate a new attack which may be more pronounced. Patients belonging to the third subgroup should be referred to a neurologist as operation is generally useless.

In Group 2 patients belonging to the first subgroup often improve with rest but operative treatment is best. Those belonging to the second subgroup also all improve with rest but not permanently. If the goiter enlargement is circumscribed it should be removed first; otherwise the associated condition should be corrected first.

In typical exophthalmic goiter expectant treatment may rival surgery in results, but under favorable conditions surgery may secure in months what expectant treatment can attain only in years. Surgical treatment, moreover, does much to prevent relapse, cardiac degeneration, and the rare but disastrous hyperacute termination.

In cases of secondary hyperthyroidism in which one lobe is predominantly enlarged operation should be done early. Goiters which persist for a long time are not innocent unless they have become calcified as they may become toxic or affect the heart muscle.

C. R. STEINKE.

Tongs, M. S.: Ecto-Enzymes of Streptococci. *J. Am. M. Ass.*, 1919, lxxiii, 1277.

Enzymes are of two sorts, ecto-enzymes and endo-enzymes. The former are excreted from the organisms into the surrounding medium. The medium may be varied so as to furnish material for the study of the different types of enzymes.

The author describes the details of his study of ecto-enzymes of hemolytic streptococci and concludes as follows: "There seem to be three groups: one digesting casein, one starch, and the other neither casein nor starch. Among the green-producing streptococcal organisms only two groups are indicated: one digesting casein and the other without action on starch or casein." K. L. VEHE.

Loeb, L.: Further Investigations on the Origin of Tumors in Mice. VI. Internal Secretion as a Factor in the Origin of Tumors. *J. Med. Research*, 1919, xl, 477.

In his experiments the author used strains of mice in which he had previously followed the normal cancer rate and the cancer age through a number of generations and had found them to be approximately constant.

It was discovered that castration carried out during the first four or five months of life prevented cancer. Previously he had observed that prevention of breeding also had some influence on the cancer incidence in mice, but to a much less extent than castration. His objects in the study here reported were: (1) to confirm these results through further experi-

ments; (2) to define in a more definite way the time limit at which castration is still effective; (3) to determine whether there is a graded relation between the age at which castration is carried out and the cancer rate or whether an "all or nothing" rule prevails; and (4) to determine whether castration affects the tumor rate of different strains of mice equally or whether its influence is limited to certain kinds of mice.

In addition he continued his observations on the effect of breeding and non-breeding on the cancer rate, and he carried out also the reverse experiments. He transplanted ovaries into castrated male mice in order to determine whether cancer of the mammary gland could be made to appear in these animals.

It was found that a hormone given off by the ovary regulated the tissue changes which led to the development of cancer of the breast in mice. The influence of this hormone was quantitatively graded. If the quantity of the hormone which had a chance to act on the tissues exceeded a certain limit, cancer appeared as frequently as in non-castrated controls (castration at the age of eight to ten and a half months), while if an intermediate quantity of the hormone had been active, the cancer rate was noticeably diminished and the cancer seemed to appear later in life (castration at the age of five to seven months). If the quantity of the hormone was restricted still further, cancer did not appear at all or only exceptionally (castration at the age of three to five months).

After an intermediate and late castration, not only did tumors appear in the first age period, but the development of tumors which in control mice appeared in the third age period was not prevented. This fact suggested to the author that the tissue changes which eventuated in the development of cancer occurred at a much earlier period in life, and that castration affected these primary tissue changes rather than the secondary transformation of these changes into fully developed carcinomatous growths.

The effect of castration on the tumor rate was not limited to one particular strain, but was effective in all the strains which have been tested so far.

Prevention of breeding in mice lowered the tumor rate and raised the tumor age only slightly; its effect was not comparable to that of early castration. Even in mice in which normally the tumor rate was low and tumors appeared late in life, prevention of breeding did not prevent the occurrence of cancer. Loeb found one strain in which the tumor rate was higher in non-breeding than in breeding mice. In this strain tumors appeared in breeding mice late in life. In all the others tested so far in which normally the tumors appeared at an early period of life, prevention of breeding had the typical effect mentioned.

Castrated as well as non-breeding mice which were not cancerous reached a higher age than normal female non-cancerous mice. The chance to develop cancer was therefore better in castrated and non-

breeding mice than in control mice on account of the fact that the number of mice reaching a higher age was greater.

Transplantation of the ovaries of the sisters into young castrated male mice belonging to strains with a high tumor rate did not lead to the development of tumors in the male mice.

From his results Loeb concludes that in all probability the ovarian hormone and not the effect of pregnancy and nursing are directly responsible for the difference in the cancer rate in male and female mice. His investigations demonstrated further that the relationship between the origin of cancer and internal secretion is quantitative, and he considers it now possible to analyze the conditions underlying the origin of cancer of the breast experimentally.

The effect of hormones on the development of cancer was specific. A hormone influenced the development of cancer only in organs in which under normal conditions it had a specific relation.

In certain cases, at least, internal secretion exerted an influence on the growth of adenomata, but was without noticeable effect on the growth of carcinomata after they had been established. On the other hand, it was proved to have a definite effect on tissue changes which led to the development of cancer, and the prevention of the effect of this internal secretion at a sufficiently early period of life prevented the development of cancer, while the elimination of such an internal secretion did not exert any marked effect on the growth of cancers after they had once developed.

In man, Loeb considers three factors active in the development of cancer: (1) heredity; (2) irritation (physical stimulation); (3) internal secretion (chemical stimulation).

Internal secretion seemed to cause cancer only in co-operation with hereditary factors. On the other hand, hereditary factors needed in many cases the co-operation of hormones in a definite quantity.

Physical stimulation was also under certain conditions associated with hereditary factors in the origin of cancer, but, on the other hand, the evidence pointed to the conclusion that if the physical stimulation was sufficiently strong cancer might develop without the co-operation of these hereditary factors.

G. E. BEILBY.

Pfahler, G. E.: Radium Combined with Electrocoagulation, Surgery, and Deep Roentgentherapy in the Treatment of Malignant Disease. *Am. J. Roentgenol.*, 1919, n. s. vi, 488.

Although radium, surgery, electrocoagulation, and roentgentherapy have proven themselves of distinct and positive value in the cure of malignant disease, none of these methods is entirely satisfactory. A combination of them, however, offers a reasonable chance of recovery in certain cases in which recovery cannot be expected following the use of any single one of them. Postoperative roentgentherapy has been used for many years with good results, and during the past two years the author has been rec-

ommending ante-operative radiation with the object of reducing the malignancy of the cells and thereby preventing or retarding recurrence. During the last six years he has been combining also electrocoagulation, radium, surgery, and roentgentherapy in a number of cases and has obtained results which he believes could not have been produced by any single method. Electrocoagulation was used with the hope of preventing re-inoculation or extension of the disease, and roentgentherapy to reach metastases and destroy any remaining cells that were not removed by the operation. Radium was used within cavities with the best results.

A number of illustrative cases are cited in detail. An epithelioma on the inside of the cheek and a carcinoma involving a large part of the mouth were successfully treated by a combination of all four methods. Three cases of sarcoma within the mouth were treated with good results by a combination of radium and roentgentherapy. A similar combination was tried in several cases of carcinoma of the oesophagus, but as all were far advanced, none of the patients was cured. A case of inoperable carcinoma of the uterus treated with radium and roentgentherapy gave brilliant results, but in several cases of carcinoma of the bladder treated similarly there was only temporary improvement. Two cases treated by all four methods were apparently cured. In several cases of carcinoma of the rectum, radium and roentgentherapy were used, but although some amelioration was obtained, no cures resulted. A case of recurrent pituitary tumor was treated by radium and roentgentherapy with some improvement of the condition.

ADOLPH HARTUNG.

SERA, VACCINES, AND FERMENTS

Fasiani, G. M.: The Production of Immune Serum against Anaerobes Causing Gas Gangrene (Preparazione e studio di sieri immuni contro germi anaerobi agenti di gangrena gassosa). *Arch. ital. di chir.*, 1919, i, 37.

There is considerable confusion in regard to the classification of the pathogenic anaerobes, many workers in bacteriology describing under different names bacteria which in reality are identical organisms. The great number of gas gangrene infections during the war gave great impetus to research concerning their etiology. Fasiani has endeavored to classify the principal organisms causing gas gangrene into three groups:

1. A non-motile anaerobe, known before the war and described as *bacillus perfringens*, *bacillus phlegmonis emphysematosæ*, and *bacillus aerogenes capsulatis*.

2. A motile spore-forming anaerobe described as *bacillus oedematis maligni* and *vibrio septique*.

3. A group of motile, spore-forming anaerobes, found for the first time during the war and described by various authors as *bacillus oedematis*, *bacillus bellonensis*, *bacillus anonimo*, and *bacillus dei gasoedem*.

There are numerous types belonging to each of these groups. Fasiani isolated 75 different strains from cases on the Italian front. Sera against each group were prepared by injecting the organisms intravenously into horses. The immune sera were then tested for various antibodies and the protective and curative properties carefully tried on animals. The results may be summarized as follows:

1. Immune sera against Groups 1 and 2 contain precipitins, agglutinins and antitoxins but no bacterolysins. They possess protective and curative properties when used in animals. Complement fixation does not occur. The best serum is obtained by the use of organisms in culture, a total culture being given intravenously.

2. Immune serum against Group 3. This was prepared like the serum against Groups 1 and 2 but the use of toxin as an antigen is more practical and clinically more efficacious. The resulting serum contains precipitins, agglutinins, and antitoxins. It causes complement deviation but has no antimicrobial properties.

3. The protective and curative power of the serum was not tested in man but gave excellent results in laboratory animals. I. F. VOLINI.

BLOOD

Krumbhaar, E. B., and Krumbhaar, H. D.: The Blood and Bone Marrow in Yellow Cross Gas (Mustard Gas) Poisoning. Changes Produced in the Bone Marrow of Fatal Cases. *J. Med. Research*, 1919, xl, 407.

The remarkable changes in the peripheral blood caused by yellow cross gas (mustard gas or yperite, with dichlorethyl-sulphide as the chief constituent) have been described by the authors in a previous paper. The chief of these changes was a more or less extreme leucopenia which followed the initial leucocytosis and in severe cases frequently fell below 1,000 cells per cubic millimeter. A leucopenia was found in 23 of the 108 cases examined, but owing to conditions of service most of these patients could be examined only once, shortly after being gassed. Of the cases in which more than one examination was made, there was a definite leucopenia in 19 out of 31 and a falling count in 6 of the remaining 12. When the leucocytic count fell below 5,000, recovery followed in only 3 cases. Accordingly severe leucopenia came to indicate a very bad prognosis, and persisting leucocytosis a good prognosis. The changes in the leucocytic count proved to be due chiefly to variations in the polymorphonuclear elements with disappearance of eosinophiles in the acute stages and temporary appearance of myelocytes. It was suggested to the authors that the leucopenia might have an important bearing on the lack of resistance shown in such cases.

The study of the bone marrow indicated by the described changes in the blood was next undertaken. This showed that attempts at blood regeneration were occasionally absent entirely, nearly always

slight or moderate, and never to be compared with the amount of hyperplasia found in acute infections. The authors believe that the blood and bone-marrow changes were due to direct action of the poison and not to secondary infection because: (1) they were well marked in cases in which infection was slight or absent; (2) influenza, typhoid, malaria, and such "leucopænic" infections played no part in these cases; and (3) the kind of infection present (pyogenic) did not lead to leucopenia or impaired bone-marrow function.

The material for this study came from 75 autopsies in mustard-gas cases, in 55 of which the bone marrow was examined. In every instance a cylinder measuring about 3 in. was removed from the mid-portion of the right femur, placed on filter paper, put at once into Zenker's fluid, and then through the routine paraffin technique. The most satisfactory staining results were obtained with hæmatoxylin and eosin, though Ehrlich's triacid, Wright's, Pappenheim's, and Unna's polychrome methylene blue were also used in some cases. In a few instances sections from a rib and smears from a rib and a femur were made in addition.

The authors give the details of their findings in some of the typical cases and draw the following conclusions:

Yellow cross or mustard gas exerted on the bone marrow a direct toxic action which, by depleting the leucocytes of the circulation, had an important bearing on the inability to resist secondary infection that was found in that form of gas poisoning.

This toxic action on the bone marrow was shown by small areas of necrosis and by inhibition of the regeneration process, chiefly of the leucogenetic series.

Not only was the amount of regenerative hyperplasia inadequate (as compared with the marrow hyperplasia of various acute infections), but also the quality was inferior, that is, the great majority of the hæmopoietic cells present were of immature types. G. E. BEILBY.

Giffin, H. Z.: Persistent Eosinophilia with Hyperleucocytosis and Splenomegaly. *Am. J. M. Sc.*, 1919, clxviii, 618.

The protocol of the case reported is as follows:

The patient was a man 31 years of age who had marked splenomegaly and slight enlargement of the superficial lymphatic glands. Before splenectomy there was a leucocytosis of 21,800 with an eosinophilia of 73.6 per cent. Splenectomy was done July 15, 1914. The weight of the spleen was 2,110 gm. and its macroscopic appearance similar to that of myelogenous leukemia. Following the operation there was a rapid increase of the leucocyte count to 97,200 and later to 211,000. The eosinophilia increased from 79 to 90.7 per cent. The general condition remained good for four years following the splenectomy. Death occurred Jan. 19, 1919, from empyema following pneumonia. Necropsy showed enormous numbers of eosinophilic polymorphonuclears in all

hæmopoietic organs; numerous eosinophilic myelocytes in the lymph glands, the spleen, and the bone-marrow; obliterative pericarditis; and fibrous perihepatitis.

The most important finding was the very high percentage of eosinophiles, ranging from 66.3 per cent to 90.7 per cent, in association with a leucocyte count varying from 15,400 to 208,000. Previous to splenectomy, however, the leucocyte count had never been higher than 21,800.

A discussion of the origin and function of eosinophiles, the clinical incidence of eosinophilia, and a review of the literature with respect to the occurrence of persistent eosinophilia with hyperleucocytosis follow. Cases reported in the literature in which the eosinophiles have even temporarily exceeded 25 per cent are very rare. One case of Hodgkin's disease with an eosinophilia of 33.3 per cent came under the writer's observation. One case with cardiac decompensation, one with carcinoma of the colon, and a third with an indeterminate type of lymphadenoma associated with high eosinophilia were found in the literature. The leucocyte count in these cases was not exceedingly high and in none of them was there marked enlargement of the spleen. Only 3 instances of eosinophilia associated with marked hyperleucocytosis were discovered. One was diagnosed as "lymphatic endotheliomatosis" and another as "lymphsarcoma." In both of these instances the leucocytosis was transient and the eosinophilia fluctuating.

The only case which conforms to the one reported in this paper is that of Stillman which was shown before the New York Academy of Medicine in 1912. In this instance the leucocyte count varied from 118,000 to 165,000 and the eosinophiles ranged from 85.8 to 91 per cent. The spleen was slightly enlarged and the lymph nodes were palpable. The patient was under observation for only a short time, however, and his subsequent record is unknown.

While the writer does not entirely discard the view that in his own case an actual eosinophilic leukemia may have been present, he is inclined to regard the condition as an instance of eosinophilic hyperleucocytosis resulting from a long-continued infectious or toxæmic process.

Rothschild, M. A., and Felsen, J.: The Cholesterol Content of the Blood in Various Hepatic Conditions. *Arch. Int. Med.*, 1919, xxiv, 520.

In studying the hypercholesterinæmia of cholelithiasis, Rothschild and Felsen encountered a group of patients with continuous hypercholesterinæmia. Even after operation at which all causes for obstructive hypercholesterinæmia were removed, they found that these patients again became hypercholesterinæmic.

In work previously published the authors gave the evidence for believing that the liver is the regulator of the cholesterol metabolism of the body, the cholesterol being kept at a more or less constant level by its excretion in the bile. It seemed of

interest to them, therefore, to ascertain the cholesterol content of the blood of patients with various disorders of the liver usually associated with icterus.

In obstructive icterus due to cholelithiasis, a hypercholesterinæmia of a rather severe grade was observed in almost every case. The amounts in the blood varied from 700 mg. to 250 mg. per 100 c.c. The degree of jaundice bore a definite relation to the amount of cholesterol in the blood, indicating that this cholesterinæmia was due to the obstruction of the bile-duct. However, there was an occasional exception; a jaundiced patient with high temperature and infection showed a lower cholesterol content of the blood than a patient with the same degree of jaundice but no active infection.

In other conditions associated with icterus, such as cirrhosis of the liver, acute yellow atrophy, the pernicious vomiting of pregnancy, etc., the cholesterinæmia bore no relation to the intensity of the icterus. The authors examined the blood in 15 cases of cirrhosis and found a maximum content of cholesterol of 0.24 per cent and a minimum of 0.065 per cent. Only 1 patient in the 15 showed a moderate hypercholesterinæmia, the amount of cholesterol being 240 mg. per 100 c.c.

All these patients were jaundiced. The extent of jaundice in those with only 0.105 per cent of cholesterol was greater than in an obstructive cholelithiasis with 0.64 per cent. The two cases with extremely low amounts of 0.075 per cent and 0.065 per cent were fatal, the patients dying three days after the blood examination.

In two tables the authors give the cholesterol content of the blood examined in hepatic disorders and other icteric states. They state that these facts are extremely difficult to explain, but they appear to suggest that in severe disturbances of hepatic function there is a selective retention of bile pigments and the cholesterol is not retained. In one of their cases bile obtained at necropsy showed a rather high content of cholesterol, i.e., 0.12 per cent as contrasted with a normal content of 0.08 per cent.

In other conditions associated with icterus, such as primary or secondary carcinoma of the liver or multiple abscesses, the cholesterol content of the blood was not proportionate to the intensity of the jaundice. In carcinoma of the liver the amounts varied from 0.4 to 0.09 per cent. In 3 cases of acute yellow atrophy, a low blood content of cholesterol was associated with extreme grades of icterus, the figures being 0.087, 0.1, and 0.116 per cent respectively.

Conditions corresponding to the so-called hæmolytic types of jaundice, as seen in Banti's disease, pernicious anæmia, chlorosis, the leukæmias, and splenomegaly with icterus, were also studied. In all, a normal or decreased content of cholesterol was noted in the blood. These conditions, however, may be of non-hepatic origin.

In conclusion the authors state that in obstructive icterus due to stones, etc., the cholesterol con-

tent of the blood was markedly elevated and bore a definite relationship to the intensity of the icterus.

In conditions associated with hepatic disorders, the cholesterolin content of the blood was not increased, but usually reduced. The cholesterolinæmia was not proportionate to the amount of bile pigments in the blood.

In the so-called hæmolytic icterus, there was no increase of blood cholesterolin. G. E. BEILBY.

BLOOD AND LYMPH VESSELS

Camera, U.: Lesions of the Large Vessels (Sulle lesioni dei grossi vasi). *Clin. chir.*, 1919, n.s. xxvi, 737.

Camera considers the more important traumatic lesions of the large vessels and describes, first vessel wounds without immediate hæmorrhage. Eight cases of this kind came under his observation. Although there seemed to be a definite break in the continuity of the vessel wall, hæmorrhage did not occur at the time of injury but only after a lapse of days or weeks or after operative interference. The delay in bleeding in such cases may be due to several factors: (1) contraction of the vessel wall; (2) plugging of the vessel injury by a foreign body such as a shell fragment; and (3) a clot of blood in the wall of the vessel. Camera cites 4 cases of his own in which the foreign body acted as a hæmostatic plug.

Spontaneous cure is possible but the policy of non-interference is fraught with grave danger. Sudden death is frequent. The great difficulty lies in the diagnosis. Camera emphasizes the following points: (1) the anatomical site of the wound; (2) the condition of the circulation below the lesion; cyanosis, coldness, loss of pulsation in the vessels, etc.; (3) deep, intense pain in the extremity; and (4) pronounced functional disability of the limb.

The treatment is variable. Suture is probably best but difficult. Camera does a proximal and distal ligation with excision of the injured portion, giving due consideration to collateral anastomosis.

Vessel injuries with immediate hæmorrhage require prompt attention, with energetic treatment for the so frequently associated anæmia. In these cases Camera was struck by the loss of tone of the vein walls.

Hæmatomata, circumscribed or diffuse, due to injury of vessel walls are potent factors in the poor healing of wounds and frequently lead to infection. Although many of the local signs are closely simulated by gas gangrene, the presence of thrills, interference with the circulation below the lesion, and sometimes discoloration of the skin as a rule determine the diagnosis. Ligation of the vessel with removal of the injured portion is the treatment of choice.

True arterial aneurisms of traumatic origin are rare, and were especially rare in the battle zone. Time is required for their development. Pulsating

hæmatomata or false aneurisms were very common. In 20,000 wounded in a period of twenty-nine months Camera saw only three cases of aneurism and these were all of the arteriovenous type. The symptoms of this variety are classical. As in all other vessel injuries, treatment should be instituted early. The argument to wait until collateral circulation is established is not sound. The complications and dangers are great. Camera lost one patient the night before the date set for operation. The easiest, most efficacious, and safest routine treatment is ligation. One ligature should be placed at the extremities of each vessel, the intervening aneurism resected, and the vessels sectioned. Extirpation of the communicating sac with lateral suture of the vessels or removal of a section of each vessel with subsequent end-to-end suture is difficult, demands a proficient technique, and gives uncertain results.

Secondary hæmorrhage is an important complication, the result of vessel injury in an infected field. Camera claims, however, that there must be some other factor beside infection. Quénu believes that most cases of secondary hæmorrhage are due to unrecognized vessel injuries. Injury to the vessel wall produces an area of decreased resistance to infection by suppurative processes. Camera coins the term "decubitus vascular" to denote the mode of injury and reviews his cases. The cause of pressure ulceration of the vessel wall in the presence of infection in his cases are enumerated. The vessel was: (1) in contact with the tibia after resection; (2) cut by the ligature which necrosed through; or (3) in contact with a drainage tube.

Therefore direct contact with pressure upon the vessel and ulceration due to a ligature, drainage tubes, or bony edges in the presence of an infection contribute to secondary hæmorrhage. When there is danger of injury to large vessels Camera uses gauze for drainage. I. F. VOLINI.

POISONS

Donati, M.: Latent and Atypical Tetanus in War Wounds (Tetani latenti e tetani atipici in feriti di guerra). *Arch. ital. di chir.*, 1919, i, 1.

Donati, who was director of the Military Hospital of Vicenza during 1915, relates his experiences with atypical cases of tetanus.

Tetanus develops after the prophylactic administration of antitetanus serum as: (1) mild tetanus with a long incubation period in cases in which prophylactic immunization is incomplete; (2) local or partial tetanus; and (3) fulminating tetanus with a very short incubation period.

The author cites cases of infected wounds with no symptoms of tetanus in which tetanus bacilli and spores could be demonstrated by cultural examination. Animal inoculation experiments occasionally proved positive when other bacteriological methods failed. Some cases with very mild symptoms were recognized only after attention was directed to them by positive bacteriological reports.

The most important clinical sign in the very mild types was the increase in reflex response, hyperexcitability of the tendon and muscle reflexes. The importance of early recognition by culture and clinical examination will not be underestimated when the fact is known that many cases originating as local tetanus become generalized and occasionally lead to death. The cases cited responded quickly to antitetanus serum and subcutaneous injections of phenol solution.

I. F. VOLINI.

Biancheri, A.: Local Tetanus of Very Late Development and Slow Course following the Use of Serum (Tetano postserico locale ipertardivo a evoluzione lenta). *Arch. ital. di chir.*, 1919, i, 15.

The systematic use of prophylactic antitetanus serum in cases of war wounds has rendered the classical picture of tetanus rare, changed the time of development of the condition, i.e., the incubation period, and, most important, has caused the localization of the condition to one extremity or a group of muscles.

The reports in the surgical literature indicate a form of tetanus called "local tetanus" which, originating as a localized form of the disease, is characterized by increased muscle tonus in an extremity, a true tonic spasm, hyperexcitability of the muscle and tendon reflexes, and very often localized clonic convulsions. These local manifestations tend to become more or less generalized and occasionally death results. Biancheri, however, states that the term "local tetanus" should be reserved for cases in which the tetanus occurs in the extremity bearing the wound and the symptoms remain localized to that extremity from the beginning to the end.

The incubation period is variable; in some cases the condition appears a few days after injury and in others not until after a lapse of from one to three or more months. One form follows operative intervention after cicatrization of the wound. Although it may not develop until many months after an injury on the battle front, its symptoms develop a few days after operative trauma. Biancheri reports the following case:

The patient was a soldier who was wounded August 24, 1917, in the fleshy portion of the right thigh but suffered no bone or nerve injury. A few hours afterward serum was administered. The wound suppurated but healing was complete on discharge from the hospital, Oct. 24, 1917. A piece of shrapnel remained in the thigh. The patient was then returned to the front where, put on full duty, he endured all the hardships and exposure without any complaint or physical evidence of inability to stand the strain. On Oct. 14, 1918, fourteen months after his injury, and following a march of 25 kilometers, his thigh felt tender to the touch and slightly swollen. His right leg then became rigid and there was tonic contraction of the muscles so that flexion of the knee became impossible. A very slight degree of trismus was noted which was asso-

ciated with spasmodic convulsions localized in the right leg and thigh. The trismus disappeared after the use of antitetanus serum, but the extremity remained rigid, with a talipes equinus, and the attacks of clonic spasm persisted. X-ray examination revealed the foreign body in the thigh. On March 14, 1919, the piece of shrapnel was removed. At the same time serum was given, although the patient had been receiving antitetanus serum at regular intervals. Recovery was prompt so that by April 15, 1919 the patient was able to use his leg and cultures from the wound remained sterile. Biancheri discusses the diagnostic possibilities and states that he is convinced that this was a case of local tetanus. It is unique in that the incubation period was so protracted and the fact that the symptoms did not follow operative trauma.

I. F. VOLINI.

EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

Loeb, L., and Fleisher, M. S.: The Growth of Tissues in the Test Tube under Experimentally Varied Conditions, with Special Reference to Mitotic Cell Proliferation. *J. Med. Research*, 1919, xl, 509.

While in their previous publications dealing with the growth of tissues in culture media the authors occasionally referred to mitotic cell proliferation, they were concerned mainly with the analysis of the factors which determine the movements of tissues. In this paper they report on several series of experiments in which they analyzed the factors determining the mitotic proliferation in tissues growing in culture media under varied conditions.

For a description of the method used (test-tube method) and for their former publications on this subject, they refer to their preceding paper which was published in the same journal.

In the investigation here reported special attention was given to the significance of oxygen for the mitotic cell proliferation *in vitro*. Mitotic proliferation was found in epithelium of the skin transplanted into culture media in experiments in which the living body served as the incubator. Thirteen series of experiments were carried out. In each case the tissues were transplanted into the test tube, and in each experiment a considerable number of pieces with the necessary controls were used.

With certain exceptions, notably in the cases of organs which had the power to liquefy the coagulum, pieces of organs growing in culture media in the test tube underwent changes which, in all essential respects, were comparable to those observed after transplantation into the subcutaneous tissue. The loss of tissue individuality and differentiation was not greater in tissues growing in the test tube than in the subcutaneous tissue.

Mitotic proliferation was often very intensive *in vitro*, not only in fibroblasts, but in various kinds of parenchyma, especially cells which were able to proliferate after subcutaneous transplantation.

In a comparison of the mitotic proliferation of epithelium with that of connective tissue certain differences suggested the possibility that there are two kinds of growth stimuli: (1) primary stimuli exerted directly by the environment, and (2) secondary stimuli caused by changes in the tissue due to the primary response, in particular the migration of cells. On the whole, the parenchymatous mitotic proliferation was much more regular than that of the fibroblasts, and the sum of epithelial mitoses considerably exceeded the sum of the fibroblastic mitoses.

The same primary stimulus caused in cells migration and mitotic cell proliferation, but according to the differences in the structure of the cells it called forth the first of these two responses more readily in one kind of cells and the second in another kind.

Continued investigations confirmed the authors' previous conclusions as to the significance of oxygen in the activities of tissues in the test tube. New experiments made it appear very probable that the introduction of pure oxygen increases the zone of living tissue and the mitotic activity, especially of the parenchyma, under conditions in which there has been a deficiency in oxygen.

Tests were made also to determine the effect of adding KCN, red blood corpuscles, and micro organisms to the plasma, of variations in osmotic pressure in the culture medium, and of impurities in the air on mitotic proliferation in the test tube. All these conditions exerted an unfavorable influence. The amount of KCN compatible with the life of the tissues however, was relatively large. Some of the experiments suggested that possibly the addition of a very small amount of alkali might improve the mitotic proliferation in the test tube. The curve of this proliferation in the test tube differed from that after subcutaneous transplantation and was not altered to any marked extent by the introduction of oxygen.

Tissues showed a marked mitotic cell proliferation when kept in liquid blood serum and in this case the proliferation was mainly parenchymatous. The outgrowth of cells into the culture medium under only certain conditions was considered as an indicator of tissue activities. These activities were pronounced without any noticeable associated outgrowth of fibroblasts.

The use of regenerating tissues for purposes of transplantation *in vitro* as well as in the test tube was advantageous only in cases in which the regeneration led to the production of a greater number of elements which were more resistant and more active, and in which the proportion between the cells and intercellular structures had been altered to the advantage of the former. Usually the newly created, more resistant elements had at the same time a structure which was less differentiated and diversified than that of the elements they replaced.

The stereotropic reaction of the fibroblasts and perhaps of other cells determined not only the direction of the migration of the cells, but also the direction in which the latter proliferated mitotically.

The arrangement of the fibers being an important factor on which the number of cells which migrated into the coagulum depended, it also determined therefore secondarily the intensity of mitotic cell proliferation in the cells which had the power of migrating into the coagulum.

G. E. BEILBY.

Akaiwa, H.: A Quantitative Study of Wound Healing in the Rat. II. Cell Growth during Wound Healing. *J. Med. Research*, 1919, xl, 371.

In a preceding paper Akaiwa discussed the quantitative changes which took place during the different periods of wound healing in the cell movements of the contraction of the wound and the thickness of the epithelium.

In this communication he analyzes the processes of cell proliferation as they presented themselves in mitotic proliferation, the increase in size of cell and nucleus, and the changes in the number of cells in the epithelium covering the defect and in the epithelium adjoining the wound during the different periods of wound healing.

Akaiwa summarizes his study as follows:

The proliferative power of the epithelium was determined by counting the mitoses and the number of living cells in the defect as well as in the tissue adjoining the defect. During the early stages of wound healing the mitoses increased markedly in the old epithelium as long as the wound was open. The number of mitoses was as a rule proportionate to the quantity of the cells which had moved into the defect. In the outgrowing epithelium, on the other hand, the mitoses were few because the new epithelium, consisting of cells which had left the old epithelium and wandered into the defect, was not yet able to divide mitotically, probably on account of unfavorable environmental conditions. The number of cells which moved into the defect was one of the factors which determined the number of mitoses in the epithelium adjoining the wound.

Before the closure of the wound the number of mitoses and of cells in the old epithelium increased very markedly, and the increase in the case of both took a parallel course, a maximum being reached in both at the time of closure. Soon after the closure a sharp fall in the number of mitoses and a more gradual decrease in the number of cells took place.

Throughout the time of observation the number of mitoses and of cells in the old epithelium was greater in the area near the border of the wound than in the area further removed.

The mitotic proliferation in the outgrowing epithelium showed in most cases a sharp rise in the period following the first three and a half days, and a maximum was reached at the time of the closure of the wound. The number of mitoses often remained high for one or two days following the closure. Only then a sudden decline in the number of mitoses took place, while again there was a much more slow diminution in the number of cells. In other cases the closure of the wound was directly followed by a sharp fall in the number of mitoses.

As far as the proliferation of the epithelial cells was concerned, there was a certain equilibrium between the new and the old epithelium. In the earlier periods of wound healing a remarkable number of mitoses were observed in the old epithelium, while in the outgrowing epithelium only a few mitoses were found. In the latter the mitotic proliferation seemed to return almost to the normal level soon after closure of the wound, while in the outgrowing epithelium it remained very active. However, in both outgrowing and old epithelium the mitotic proliferation returned, as a rule, almost to the normal condition about fourteen days after operation.

A comparison between the total number of mitoses and cells in the new epithelium on the one hand and the two unit areas of the old epithelium on the other hand during the period of wound healing, showed that the absolute number of mitoses in the new epithelium was greater than the number in either of the two units of old epithelium, while the relative number of mitoses in one unit area of the new epithelium was always smaller than the number of mitoses in the first unit of the old epithelium, and usually smaller, though at other times larger, than the number of mitoses in the second unit area of the old epithelium.

The larger wound caused a greater mitotic proliferation in both the new and the old epithelium than the smaller wound. Furthermore, in the larger wound the increase in the number of mitoses and of cells extended over a larger area in the old epithelium than in the smaller wound. Both the absolute and relative total numbers of mitoses and newly formed cells were therefore greater in the case of the larger wound than in the smaller wound and this difference was due mainly to the great difference in the proliferative energy between the two kinds of tissues in the period just preceding and following the wound closure. On the other hand, in the earlier and later period there was no noticeable difference in the number of mitoses and of cells.

The more shallow the wound the more easily the epithelium moved over the defect in the early period following the creation of the wound and the larger the number of cells which moved into the defect. In the earlier period a greater increase took place in the number of mitoses and cells in the old epithelium in the more shallow wounds than in the deeper wounds, but just preceding the time of closure and in the latter half of wound healing the number of mitoses and cells was everywhere greater in the deeper than in the more shallow wounds.

The variations in the size of the epithelial cells and nuclei were as a rule concordant with the variations in the proliferative activity and the rapidity of movement of the cells. The cells and nuclei in the old epithelium adjoining the wound increased markedly in size on the second day following the creation of the wound and a maximum was reached in both the larger and the smaller as well as in the shallower and the deeper wounds at the time just preceding

and following the closure of the wounds. After the closure there was a sudden decrease in size and this decrease continued until, on the fourteenth day, the size of the cells and nuclei had again become nearly normal.

The cells and nuclei in the outgrowing actively moving epithelium varied markedly in size and form in the different periods and at different places during the wound healing. A maximum in the size of the cells and nuclei was reached in the new epithelium at the time just preceding the closure, just as in the old epithelium.

The form of the basal cell differed in the different periods of wound healing. In the old epithelium the form of the basal cell was always cylindrical as long as the cell proliferation was active, while soon after the decline in cell proliferation had set in the cells became gradually lower, and in rotation they assumed a spherical, a cuboidal, and at last a flat shape. Before the closure of the wound the cells in the new epithelium were always very low and extremely elongated, especially in the larger wound, and this condition lasted as long as the cell movement continued very actively. After the closure, however, the cells became higher and higher, particularly in the center, owing to the pressure which they exerted upon each other.

The variations in the number of cell rows and in the thickness of the stratum germinativum were likewise as a rule concordant with the variations in the proliferative activity as well as the energy of the cell movements and with the resulting variations in the size of the cells. Throughout the different periods the number of cell rows and the thickness of the stratum germinativum in the old epithelium were greatest at the wound border, and from here they gradually decreased toward the old epithelium as well as toward the defect. The number of cell rows as well as the thickness of the stratum germinativum gradually increased up to a maximum which was reached just before or after the time of closure of the wound.

Soon after the wound closure a sudden decline usually took place. On the fourteenth day after operation the thickness of the stratum germinativum and the number of cell rows in the old epithelium were nearly restored to normal. In the new epithelium the number of cell rows and the thickness of the stratum germinativum showed a curve of variations similar to that in the old epithelium; the maximum was reached at about the same time as in the old epithelium or slightly later. In the case of the larger wounds the number of cell rows and the thickness of the stratum germinativum increased more markedly in the old epithelium, and this increase extended over a wider area in the old epithelium than in the case of the smaller wounds, particularly in the first three and a half days following the operation. After the closure of the wound the figures were only very slightly greater in the large than in the small wounds.

Before closure the increase in the thickness of the stratum germinativum and the number of cell

rows was greatest in the perforated wounds, but after the closure the difference as regards the number of cell rows and thickness of the stratum germinativum between perforated and deeper wounds on the one hand and shallower wounds on the other hand became much smaller. The thickness of the new epithelium was much greater in the deeper than in the more shallow wounds throughout the time of observation, and especially in the latter half of wound healing a great difference was observed between the thickness of the new epithelium in the deeper and in the more shallow wounds.

The curve representing the changes in the size of the cells and nuclei declined in both the new and old epithelium much more slowly than the curve representing the number of mitoses. Inasmuch as the size of the cells and nuclei reached a higher maximum in the new than in the old epithelium, the curve representing the decrease in size was much steeper in the new than in the old epithelium. Likewise the curves were steeper in the larger wounds as compared with the smaller and in the deeper as compared with the more shallow wounds. The curve representing the thickness of the epithelium was similar to the curve representing the size of the cells. The thickness of the epithelium, however, decreased somewhat more rapidly than the size of the cells.

In conclusion, Akaiwa states that the proliferative power of the epithelial cells as expressed in the number of mitoses, the variations in the size of the cells and the thickness of epithelium depended to a great extent upon the closure of the wound and upon the distance from the wound; that it was different in the old, formerly resting, epithelium and in the new epithelium covering the defect; and that it varied with the size and depth of the wound.

G. E. BEILY.

ROENTGENOLOGY AND RADIUM THERAPY

Holmes, G. W., and Merrill, A. S.: *The Treatment of Thyrotoxicosis by Means of the Roentgen Ray*. *J. Am. M. Ass.*, 1919, lxxiii, 1693.

Following a brief review of the general principles and of the literature the writers consider their own cases in four groups.

Group 1—Patients in whom very definite benefit ensued, apparently as the result of the treatment, and who are clinically well; 34 patients, 3 males and 31 females. Ten of these patients were over 35 years of age and 5 under 20 years. Two had been operated upon without complete relief. The longest duration of treatment was thirty months, the shortest four months, and the average eight. A record of the metabolism showed a marked drop. In typical thyrotoxicosis the pulse follows the metabolism. Seventeen of the patients in this group gained in weight and 6 lost weight. The records for the others are incomplete.

Group 2—Patients with definite but incomplete relief of symptoms; 68 patients, 3 males and 65 females. Thirteen were over 35 years of age and 9

under 20 years. The others were between 20 and 35. In a few instances the diagnosis may have been incorrect but all of the cases were referred from the medical department for hyperthyroidism. The opinion as to the results is based upon a study of the records and the patient's statement at the time of the last visit. The average number of treatments was less than in Group 1.

Group 3—Patients who were unimproved or who became worse; 14 patients, all females and none under 20 years of age. Five were over 35 years. In 2 instances the diagnosis was probably incorrect. One patient, who had only one treatment, died following operation. Two died during treatment from intercurrent disease. Six had less than sufficient treatment. This makes 10 cases in which failure was not due entirely to the method of treatment. In two instances the results may be definitely classed as failures. One patient developed myxedema from overtreatment.

Group 4—Thirty-six cases selected from the three preceding groups which were studied somewhat completely. At least one metabolism test was made in each case and in some the metabolism was determined before and after treatment. Seventeen of these patients remained perfectly well and 13 were improved. In 4 cases the diagnosis was incorrect as proved by the metabolism test and the course of the disease.

The technique of the treatment includes the use of an 8-in. spark gap and a filter of 4 mm. of aluminum and 1 mm. of leather. Three areas including the thymus are treated with two-thirds of an erythema dose. After 3 treatments three weeks apart an interval of three months should ensue before the second series is given. If at the end of another three months the symptoms have not disappeared sufficiently, a third series is indicated. The possible dangers are hypothyroidism and telangiectasis. The three-month interval serves to prevent the former, and the avoidance of erythema, the latter. The toxæmia may increase to a dangerous degree from the first treatment. This must be guarded against by beginning with small doses preceded by rest in bed. Cases in which surgery has failed to effect a complete cure must be treated with caution because of the increased liability to hypothyroidism.

The conclusions drawn are as follows:

It is possible to decrease the activity of the thyroid gland and probably also to destroy its glandular structure by exposure to the roentgen ray.

Roentgen-ray treatment of thyrotoxicosis relieves the symptoms and shortens the course of the disease.

A study of the basal metabolism before and after treatment is of the greatest importance both as a means of diagnosis and as a check on the amount of treatment.

The roentgen ray and rest should be tried in all cases of thyrotoxicosis and continued at least long enough to destroy the thymus before resort is had to surgery.

D. R. BOWEN.

GYNECOLOGY

UTERUS

Freeman, L.: Suspension of the Uterus with a Strip of Fascia Lata in the Treatment of Prolapsus. *Surg., Gynec. & Obst.*, 1919, xxix, 511.

The operation described is similar to the suspension of the uterus by means of the round ligament except that a strip of fascia lata about 6 inches long is taken from a thigh and passed through the uterine muscle at the fundus just above the entrance of the tubes, the free ends being passed through the recti muscles in a manner similar to the Gilliam suspension with the round ligament.

The author states that this method has the following advantages:

1. The fascia lata is easy to obtain in any desired quantity.
2. It is very strong and will not stretch to any appreciable extent, thus differing from the natural supporting ligaments of the uterus.
3. It does not become absorbed, like catgut, but incorporates itself within the tissues and permanently holds the uterus where it is placed.

During the past few years the author has operated upon 11 cases according to the above technique. There have been no deaths but in several instances a ventral hernia has developed. C. H. DAVIS.

Beclère: Radiotherapy of Uterine Fibromyomata; Results, Mode of Action, and Indications According to the Statistics of 400 Personal Cases (La radiothérapie des fibromyomes utérins, résultats, mode d'action, et indications d'après une statistique de 400 observations personnelles). *Bull. gén. de thérap.*, 1919, clxx, 702.

Of the 400 patients 24.5 per cent were 50 years of age or over, 64 per cent between 40 and 50 years, and 11.5 per cent between 30 and 40 years.

Three hundred and thirty-eight of the 400 uteri treated were accessible to abdominal or vaginal palpation and more or less above the symphysis pubis. In about 84.5 per cent of the cases the growths were abdominal rather than pelvic. The predominant symptom was more or less copious metrorrhagia.

The method employed was that of bi-weekly treatments with small dosage. At each treatment 2 successive irradiations were given, one at the right and the other at the left of the median abdominal line. Each irradiation was localized to a circular area about 10 cm. in diameter. The focal distance of the ray varied from 18 to 22 cm. above the center of the surface treated. The Coolidge tube with a current of 3 ma. was employed. Each irradiation lasted five minutes at the most. Some slight modifications in the established technique were made.

The thickness of the aluminum filter was increased to 5 mm. Therefore, even with a 3 ma. current the raying did not exceed 3 Holzknicht units. In 60 per cent of the cases the treatment did not call for more than 12 to 14 sittings and lasted only from two to three months.

As regards results, the author states that in only 4 instances was the patient obliged to undergo a subsequent surgical operation owing to persistence of the metrorrhagia. Recently, with better technique, all such results have been avoided. In every other case the metrorrhagia ceased and there were the usual heat flushes of the menopause. Usually this induced menopause remained definite, but in 12 per cent of the cases it was only temporary, the menses returning after an interval of several months or a year. Even in these cases, however, there was a return of amenorrhœa and in the majority a later persisting menopause.

In all cases the uterine tumor was not only arrested but was diminished in volume. In 278 of the cases in which the result was studied carefully a lowering of the upper pole of the fibromatous uterus ranging from 1 to 16 cm. was observed at the end of treatment, the fall in the majority of the cases being from 5 to 10 cm.

The reduction in the volume of palpable uterine tumors began with the first treatments and was often appreciable by the third or even the second. The upper pole decreased in size at the rate of about 1 cm. per week.

Beclère takes the view generally supported in France that the X-rays have a primary and direct effect upon fibromyomata quite apart from their action in bringing about ovarian castration.

The results in the cases reported show that radiotherapy of fibromyomata is efficacious both before and after the fortieth year of age for voluminous as well as for small tumors, and for patients with normal menstruation as well as for those with metrorrhagia.

Except when conditions imperiously demand surgical intervention, Beclère considers radiotherapy applicable to all uterine fibromyomata.

W. A. BRENNAN.

ADNEXAL AND PERI-UTERINE CONDITIONS

Chapple, H.: Salpingitis. *Guy's Hosp. Gaz.*, 1919, xxxiii, 343.

The author quotes a history and states that similar symptoms may be present in three conditions: (1) acute salpingitis, (2) acute appendicitis, and (3) extra-uterine pregnancy.

The differential diagnosis is of importance as the second and third demand immediate surgery where-

as the first does not, except under certain definite conditions.

In making the diagnosis reliance must be placed on the history, pain, uterine hæmorrhage, the vaginal examination, the pulse, and the findings revealed by an incision through the posterior fornix into the pouch of Douglas.

Acute salpingitis is most apt to follow an abortion or labor, uterine instrumentation, or an attack of gonorrhœa. A definite history of gonorrhœa with the detection of the organisms in a smear from the urethra or cervix is very valuable information. At the same time it should be remembered that an attack of gonorrhœa in women is frequently not attended with marked acute symptoms as in the male, but is often comparatively slight and may pass almost unnoticed. The detection of gonococci in the urethral or cervical discharge will, of course, be definite evidence, but it should not be forgotten that they are not always easily detected after the lapse of a little time.

In acute appendicitis the onset is usually sudden, and the first symptom is nearly always abdominal pain.

In extra-uterine gestation there are three histories: there may have been amenorrhœa of some six or eight weeks' duration, though this is not by any means always the case; rupture of the sac may occur before the time of the next menstrual period; or the first sign may be a period of unusual length accompanied by severe pain.

The pain of acute salpingitis is often very severe, referred to the lower abdomen, and usually bilateral in position. Too much stress should not be laid on its bilateral nature, however, as in several cases the symptoms have been markedly unilateral.

The pain of appendicitis may be more or less general at first or referred to the region of the umbilicus, but usually settles down fairly soon to the region of the appendix and becomes more or less localized to the neighborhood of that structure.

The pain of ectopic pregnancy may also be very severe. The author draws attention to the fact that in this condition 7 cases out of 10 result in the formation of a tubal mole, and as this may not rupture or cause profuse intra-abdominal bleeding for several days, the pain is intermittent in character and occurs when there is a leakage of blood into the pelvic peritoneum. Of course, if the extra-uterine pregnancy ends by rupturing into the abdomen, the pain is severe and more continuous. One striking characteristic of such cases which has been noticed often is that the abdomen contains free blood and is very tender, but not rigid.

If in acute salpingitis the uterine body is also markedly affected, there is irregular bleeding from the uterus. In appendicitis is no such irregularity. In ectopic gestation, when the pregnancy is interfered with, the decidua is cast off from the uterus, an almost characteristic dark "prune juice" discharge occurs, and a cast of the uterine cavity may

be thrown off either in one large piece or in a number of smaller fragments. In the cases that end by early primary rupture there will be no uterine hæmorrhage until the decidua of the uterus is cast off, which may not be until two or three days after the rupture of the sac.

In the examination of a case of acute salpingitis at the onset no definite pelvic lump will be found, but gentle digital examination of the posterior fornix will produce a considerable amount of pain, especially if the uterus is moved and the tubes are handled. A little later, as the tubes and ovaries are drawn down into the pouch of Douglas or an exudate is poured out into that space, a definite, very tender mass will be felt.

In appendicitis, unless the appendix is low down in the posterior pouch, it will be possible to manipulate the uterus apart from the affected organ. In ectopic pregnancy, if there is a tubal mole, a definite mass will be felt. In the early stage of a ruptured ectopic pregnancy, however, there will be no mass but a collection of blood which will be detected vaginally either as a fluid filling the pouch of Douglas or as a definite hæmatocele, according to the degree of clotting present. The pulse rate in acute salpingitis should correspond to the temperature. A rising pulse rate is a definite indication for surgical treatment as it is one of the signs of a spreading peritonitis or a severe type of infection.

In appendicitis a rising pulse rate is a definite danger signal that things are going wrong. In an extra-uterine gestation a rising pulse is an indication of intra-abdominal bleeding and demands immediate laparotomy. The author emphasizes once again the importance in all three conditions of dealing with the trouble before the pulse rate has risen to any great extent.

If in acute salpingitis or appendicitis situated low in the pelvis an exudate has been passed out, an incision through the posterior fornix into the pouch of Douglas will reveal free pus, and in the case of an ectopic pregnancy the presence of blood.

The best treatment of acute salpingitis is not immediate surgery except under three conditions: (1) when the diagnosis is doubtful and cannot be made definitely; (2) when there is evidence of a spreading peritonitis or the patient is getting worse; and (3) when there is a collection of pus in the pouch of Douglas.

The author's reasons for this statement are as follows:

1. Patients often recover from acute salpingitis which, as a rule, is not fatal. This is especially true of the gonorrhœal variety which tends to localize in the pelvis and does not often spread to a general peritonitis. On three occasions the author has opened the abdomen in young women and has seen pus exuding from both fallopian tubes. As the patients were young he did not remove the tubes, but merely drained the pelvis and closed the abdomen. Since then each of these patients has had children.

2. The disease tends to become localized and if surgery is delayed until this has occurred there will be a definite lesion to operate upon and the surgeon will not find himself in the awkward position of wondering how much or how little he should remove. In the cases of young women it is vitally important that no more of the pelvic organs is removed than is absolutely necessary.

3. The risk of the operation and the chance of wound infection and subsequent hernia, etc., are soon diminished as the virulence of the organisms very rapidly becomes less. In old cases the tube contents are very frequently sterile. C. H. DAVIS.

EXTERNAL GENITALIA

Ley, G.: A Case of Congenital Teratoblastoma of the Vulva (Rhabdomyoma). *Proc. Roy Soc. Med.*, Lond., 1919, xii, Sect. Obst. & Gynaec., 190.

The author reports a rhabdomyoma in a child five weeks of age. On examination a large tumor was discovered beneath the skin of the mons veneris, the labia majora, the vestibule, the anterior parts of the labia minora, and the clitoris, displacing these structures forward. Projecting posteriorly behind the urethral orifice, which was seen as a slit slightly to the right of the midline, was a soft, reddish brown, superficially ulcerated mass which had a deep attachment passing posteriorly to the urethral orifice. On lifting up the tumor there appeared to be a vaginal orifice in the form of a transverse slit extending the whole width of the posterior margin of the tumor.

The tumor with its pedicle which included the urethra itself was excised and the neck of the bladder brought down and stitched to the surrounding skin and posteriorly to the greatly widened vaginal orifice. The child died suddenly, about one-half hour after the operation was completed.

In the neoplasm fibrous interstitial tissue and involuntary and voluntary muscle and nerves were found. It therefore contained mesoblastic and epiblastic derivatives. The tissue of which it was composed, i.e., connective tissue, muscle, and nerve, are tissues normally found in the site of origin. It is most probable, therefore, that it was a teratoblastoma and not an incomplete teratoma. The fibrous tissue was somewhat embryonic in type. A great deal of the voluntary muscle was certainly embryonic as it had a homogeneous core containing numerous nuclei, and fibrils were confined to the periphery. The tumor did not appear to be malignant. C. H. DAVIS.

MISCELLANEOUS

Rojas, D. A.: The Wassermann Reaction in Woman's Milk (La reacción de Wassermann en le leche de mujer). *Semana med.*, 1919, xxvi, 100.

Since it is often of great importance to establish definitely the presence or absence of syphilis when the patient is not aware of its presence or denies it, and since it is not always desirable to let the patient know that such investigations are being made,

Rojas considers the advisability in the case of women of making the test on the milk as most persons understand the purpose for which the blood specimen is taken.

Rojas obtained his specimens during the last months of pregnancy or not later than fifteen days after parturition in the cases of 28 women.

For this study all the reactions but one were controlled by a test of the blood serum. Seven tests were frankly positive in both milk and blood. In one case the test of the blood was positive and that of the milk negative. In two cases the test of the blood was definitely positive but in the milk the reaction was only slight. In four cases the results were negative in both blood and milk. Six tests were negative when made on blood but slightly positive when made on the milk. In one case there was retarded hæmolysis in the blood and a positive reaction in the milk. In two cases the reactions in both blood and milk were very weak. In another there was delayed hæmolysis in the blood and the test of the milk was negative.

Rojas followed the original technique of Wassermann, titrating the amboceptor and the antigen but not the complement. The specimen was obtained by milking it into a sterile test tube after the nipple has been washed with alcohol and sterile water. It was then centrifugalized for a few minutes at 2,500 revolutions per second to separate the cream. The tests were made on the remainder.

M. M. MATTHIES.

Marañón, G.: The Critical Age; A Biological and Clinical Study (La Edad Crítica). Madrid: 1919.

The proposition which Marañón proposes to demonstrate is as follows: The menopause does not depend simply on insufficiency of the genital gland, as has come to be admitted also by other authors, but is the expression of an endocrine crisis, complex and variable. In this crisis insufficiency of the genital gland is the central element, but at the same time is associated with other glandular disturbances.

This theory Marañón calls the "pluriglandular theory" of the menopause as he concludes that all the glands of internal secretion take part in the syndrome, one compensating for another as occasion arises. In his judgment, the three glands particularly concerned are the ovary, the thyroid, and the suprarenal. The hypophysis he considers of secondary importance.

THE OVARIAN FACTOR

The fundamental element in the menopause is insufficiency of the ovary which corresponds directly to the histological alteration of the ovary. This decadence of the ovary Marañón believes is induced by changes in the thyroid and suprarenal glands and coincides also with the functional regression of the hypophysis.

The ovarian secretion is not a single chemical entity, but a complex group of hormones having very different activities. These may be divided into genital hormones, sexual hormones, and general

hormones. The genital hormones control particularly the menstrual process, the sexual hormones conserve the morphological sex characteristics, and the general hormones assist in all the functions of the organism. These types of ovarian hormones correspond to analogous but less differentiated hormones of the testis.

The extirpation of the ovaries during the period of growth gives immediate evidence of the failure of these types of hormone activity. If in place of a total and abrupt pathologic suppression of the ovarian function, the suppression is gradual or physiologic, as in the menopause, the insufficiency of some of them is made up by others from distant sources. This explains the error of considering under one head all the disturbances which characterize the menopause.

The failure of the menses indicates the disappearance only of the genital hormones which are probably elaborated in the corpora lutea. The other hormones, which apparently are produced in the follicular and interstitial tissues, may either still persist, or disappear first, as the various clinical symptoms show. The menopause does not begin with the irregularity of the catamenia, but long before, with the appearance of the various general disturbances. These, according to the pluriglandular theory, must be considered legitimate symptoms of the menopause. The general symptoms of the failure of the ovarian hormones also persist long after the complete suppression of the menses. Therefore, the menopause must be considered only a phase of the critical age, and not synonymous with it. The critical age is divided into three periods: the premenopause, the menopause, and the postmenopause.

It has been suggested by some authors that the declination of ovarian activity is preceded by a period of hyperactivity. This Marañón does not consider true, but he does believe that the period is characterized by irregular fluctuations of activity as the critical age is characterized by instability.

THE THYROID FACTOR

The thyroid always intervenes in the menopause with greater or less intensity. In fact, the relation between the ovaries and the thyroid is very close as is manifested at puberty, during menstruation, and in pregnancy. This activity of the thyroid may present itself as a hypothyroidism, a hyperthyroidism, or the mixture of the two called dysthyroidism. Why the same factor (failure of the ovarian function) should give rise to such different results is not known, but it may be due to the previous condition of the endocrine system.

With ovarian insufficiency hypothyroidism is much more frequent in young women, while hyperthyroidism is more common in adults. By a series of experiments the author showed that certain climacteric symptoms which have been considered directly dependent on the lack of ovarian secretion are really symptoms of hyperthyroidism.

A large percentage of women with hyperthyroidism begin to show these symptoms during the menopause and those who were so affected before suffer an aggravation of the condition when the crisis is reached.

Emotions, infections, and therapeutic abuses all have a tendency to increase the hyperthyroidism of the menopause.

Usually the hyperthyroidism of the menopause is transitory, but sometimes it persists. In other cases it decreases to a thyroid insufficiency and even true myxoedema.

The hypothyroid reaction in the critical age is rare, but may occur in women who have suffered from hypothyroidism before. Even in these patients, however, brief signs of hyperthyroidism are often observed during the early stage of the crisis, thus presenting the picture of thyroid instability. In other cases this instability may be the permanent climacteric reaction of the thyroid.

THE SUPRARENAL FACTOR

The third factor in the menopause, the suprarenal, which is as constant an element of the crisis of the menopause as the thyroid, is responsible for a good part of the critical symptomatology and may acquire a pathologic intensity giving rise to characteristic symptoms. The reaction of the suprarenal gland is either hyperfunction or hypofunction, but the former is predominant, in fact almost constant.

In general, the secretion is due to total suprarenal hyperplasia, and consequently there are symptoms of both cortical and medullary hyperfunction.

The suprarenal gland does not follow the development of the other organs, but continues to increase in size and activity after the fortieth year. From a study of the behavior of the suprarenal gland after castration it appears evident that this hyperfunction is related to the decadence of the sexual function.

The symptoms of hypermedullary suprarenal activity in the adult are hypertension, which is sometimes accompanied by other circulatory disturbances, hyperglycemia, a tendency toward glycosuria, and tremor. In the menopause, even when there is no arteriosclerosis or other pathologic cause for it, hypertension is almost constantly present.

Nearly all the cases of hypertonic diabetes are seen during the menopause and are similar to those of suprarenal origin. Sometimes the reaction is not sufficient to produce glycosuria but the hypertension is accompanied by glycemia. During the menopause tremor is a manifestation frequently observed with the hypertension and hyperglycemia, and often with symptoms of hyperthyroidism.

The hypercortical syndrome is manifest in women by the development of the masculine secondary sex characteristics, and in men by accentuation of the virile characteristics. The same changes are observed in many women during the menopause.

By experiment Marañon determined that there is more adrenalin in the circulating blood of a healthy woman during the menopause than in the blood of a healthy young or old woman. He demonstrated also the suprarenal origin of climacteric diabetes and cholesterinæmia.

While hypersuprarenalism is the usual finding during the menopause, suprarenal insufficiency is very rare at this time. The condition is quite common in young women, however, and may grow worse when they reach the critical age. Occasionally at the menopause there is an isolated symptom of suprarenal insufficiency, i.e., melanoderma.

THE PITUITARY FACTOR

The epiphysis cerebri and the thymus having been gone since puberty and the pancreas following the general law and retrograding at the critical age, thereby merely favoring the appearance of glycosuria without having any characteristic influence, there remains only the consideration of the hypophysis.

All of the indications lead to the assumption that the extinction of sexual activity is accompanied or preceded by the parallel extinction of the activity of the hypophysis. This the author finds so constant that he sets down hypopituitarism alongside hyperthyroidism and hypersuprarenalism as completing the pathogenic basis for the majority of cases of normal menopause.

This hypopituitarism is shown by two symptoms, obesity and the weakening of the genital function. In the menopause this supposed hypophyseal insufficiency is perhaps the primary element of the crisis, contributing to the stopping of the menstrual function and, with the genital insufficiency and perhaps with the thyroid, working to produce the obesity of the menopause. When this insufficiency is very great the obesity may retrograde rapidly to an extreme emaciation. The hypophysis worn out by the forced labor of repeated pregnancies, has definitely ceased to function at all.

The final symptom of hypopituitarism is diabetes insipidus, or at least, transitory polyuria, which is observed during the menopause.

THE IMPORTANCE OF PREDISPOSITION (TEMPERAMENT) AND INFECTIONS

Some diseases tend to begin at the menopause and others, already present, may be aggravated, but the essential symptoms are expressions of the endocrine disturbances which make up the crisis. There is probably always some difficulty at this period, but the menopause should not be considered pathologic unless the woman is inconvenienced to the point of seeking the aid of a physician. Why should these disturbances be so slight sometimes, and sometimes so severe? Because the menopause is influenced by the factors which act in all the endocrine states. These are determined by the previous sexual life, the woman's temperament and disposition, infection, intoxication, and emotions.

EMOTION IN THE CRITICAL AGE

It is in the critical age that the importance of the emotional states is most clearly recognizable as an etiological factor. Patients suffering from diseases of the endocrine glands often date their illness to an emotional disturbance, and if they do not, the history of such a state can usually be brought out by a little questioning. It is further to be noticed that the symptoms of these diseases express themselves in the same way as the emotional states. From these data it is evident that the relation between the endocrine organs and the emotions is exceedingly close. For instance, a suitable injection of adrenalin will bring on phenomena similar to those of violent emotion, i.e., pallor, tremor, palpitation, etc.

Every emotion has an organic basis and it is only the psychic factor which distinguishes one from another. For purposes of pathology and etiology only emotion in general need be considered. The cerebral process is followed by a functional alteration of the endocrine glands, the cerebral stimulation being transmitted by the neuroglia. Whether an emotional state ensues depends upon the power of the stimulus and the temperament of the subject. Thus a cerebral process of joy or sorrow becomes an emotion by hyperfunction of the thyroid or the suprarenals. The greater or less predisposition to emotion depends, therefore, upon the facility of reaction of the endocrine glands. The etiological influence of emotion is also perfectly clear, but the symptoms are always those of endocrine disturbance.

Now, as has already been shown, in the menopause hyperthyroidism and hypersuprarenalism predominate—the same elements which are concerned particularly in the mechanism of emotion—and emotional instability, even to a complete change of the former character, is one of the principal complications of the crisis. On the other hand, the most complicated cases are those of women who have suffered sudden or prolonged emotional stresses in the years before the crisis. To complement the importance of the etiological function of emotion in the menopause, we find the woman in a period of her life when causes for emotion are most abundant, not the least important of these being the realization that her own youth is gone.

CHRONOLOGY; EARLY AND LATE MENOPAUSE

It is not possible to give definite dates for either the onset or the duration of the critical age, but the most intense phenomena of the crisis are usually developed between the forty-fifth and fifty-fifth years, though some women arrive at the menopause very early and others very late. It is a matter of common belief that the early appearance of the menses implies an early menopause but this has been shown not to be true.

There is often great similarity between the symptoms of puberty and the symptoms of the menopause, and the type of menstruation markedly influences the crisis. Women with abundant and regular menses come to the menopause later than

those with insufficient ovarian function. The sexual life and the social condition of the woman, as well as her personal characteristics, also influence the onset of the menopause. Climate seems to have no particular bearing, but the former state of health is of very great importance. Chlorosis, syphilis, and other general and local infections, and especially the endocrine diseases, having a marked effect upon the coming of the climacteric. All cases of precocious or delayed suppression of the menses, however, may not be the true menopause. The menses may be absent from other causes than the polyglandular complex which characterizes the critical age, and periodic hæmorrhages may continue to occur after the menopause is established.

The duration of the critical age is also extremely variable, lasting one, two, or more years, without warranting the assumption that it is pathologic.

GENITAL SYMPTOMS

The symptoms of the climacteric may be divided into groups according to the organic systems of the body. Those most constantly encountered are the genital, the circulatory, the nervous, and the metabolic. Less important are the digestive and the cutaneous. At times all the other organs may be involved.

The most marked genital symptom is the behavior of the menses. The majority of women have hæmorrhagic menstruation at intervals of more than twenty-one days for some time before the suppression, and in the amenorrhœic intervals and after the final disappearance of the menses the periodic subjective symptoms may persist. Ordinarily these hæmorrhages do not disturb the general health to any great extent, but involution chlorosis may occur and also occasionally extreme nervous depression may follow.

The gynecologist has emphasized the importance of suspecting cancer at these hæmorrhagic periods of the menopause, but in many instances there is no anatomical lesion to account for them. Such hæmorrhages have been considered an expression of hyperfunction of the ovaries. It is, however, ovarian, or rather, leutein insufficiency which causes them, for it is the hormone from the corpus luteum which causes suppression of the menses during pregnancy and the lack of this hormone which permits the excessive bleeding. The endocrine glands also take part in disturbances of the coagulability of the blood, and therefore during the menopause there may be a light state of hæmophilia. Ovarian extracts have coagulant properties which are beneficial in such cases. Secondly, the hypertension of the blood vessels which is often present operates to increase the hæmorrhage.

The types of cases in which there is gradual diminution of the menstrual flow and in which the menses are intermittent may be explained by the same theory. There remains the abrupt menopause. This may follow upon an acute illness or an intense emotional state and is easily explained by

the mechanism of emotion. The endocrine state induced by strong emotion stimulates the endocrine complex of the menopause, and if the emotion is sufficiently powerful, or a predisposition is present, permanent menopause is the result.

Corresponding morphological alterations also occur. The uterus, first slightly enlarged, gradually atrophies and the vagina and external genitalia undergo characteristic changes.

One of the most annoying symptoms of the menopause is leucorrhœa. Often it is an indication of inflammatory lesions, but it may occur periodically without other symptoms or ulterior consequences. Inflammations and neoplasms are not symptoms but rather complications of the crisis which must be mentioned because of their frequent occurrence at this time. The benign tumors tend to decrease in size after the menopause, the internal secretion of the ovary being apparently the determining factor of their growth. With respect to carcinoma, its beginning is often coincident with the beginning of the menopause, and a thorough gynecological examination should be made upon the least suspicion that the flow is not of endocrine origin in order that treatment may be undertaken early.

Very curious manifestations of the menopause are the vicarious hæmorrhages. The most numerous are the hæmorrhoidal, and next, in the order named, epistaxis, melena, hæmatemesis, hæmoptysis, and mammary hæmorrhages. Vicarious hæmorrhage is always a pathologic phenomenon due to the hypertension of the circulation and a point of lessened resistance due to former lesions.

Rectal hæmorrhages are usually benign, originating from hæmorrhoids, but carcinoma of the rectum or sigmoid must not be overlooked. Epistaxis is practically always benign. With melena the prognosis must be guarded lest it be an early symptom of malignancy. This is true also of hæmatemesis and hæmoptysis which may be manifestations of cancer, ulcer, or a reactivated tuberculous focus. Vicarious mammary hæmorrhages are very rare.

The breasts undergo changes during the menopause; fat is deposited in the retromammary region, but the glandular tissue is usually not altered, although true hypertrophy does sometimes occur. Atrophy does not take place until much later and is a symptom of senility. Many women complain of paræsthesia of the breast, and particularly of the nipple.

The period of the menopause is propitious for the development of mammary tumors. Although benign neoplasms may undergo carcinomatous degeneration, the prognosis is usually favorable, and occasionally they finally disappear. The malignant tumors are very common but their relation to the menopause is purely coincidental.

CIRCULATORY SYMPTOMS

The climacteric hypertension is the fundamental phenomenon of the complicated circulatory symptomatology which many women present at this time.

It is extraordinarily frequent, practically constant. A normal or subnormal tension is found only in women who suffer from anæmia, Addison's disease, tuberculosis, etc., and even these have a moderate and transitory hypertension on the days just preceding the period or at the time of a missed period. This hypertension begins sometimes before the menstrual disturbance and afterward disappears unless it continues as a senile hypertension due to arterial lesions. Its intensity is extremely variable and may be high without the presence of circulatory or renal lesions. As Culbertson has shown, the elevation of the diastolic pressure in the climacteric hypertension is not so great as that of the systolic. The fundamental characteristic of the hypertension of the crisis, however, is its instability, as it is accentuated during the days of menstruation and influenced by various factors, especially the emotions.

The cause of the hypertension must be sought in the endocrine factors which regulate the arterial pressure. The suprarenal and pituitary secretions being hypertensors, and the thyroid and ovarian being hypotensors, we have in the menopause a diminution of the hypotensor secretion of the ovary and an almost constant increase of the hypertensor secretion of the suprarenals.

Many women tolerate this hypertension without any subjective symptoms whatever, while others complain of headaches and palpitations which are especially troublesome at night. The vasomotor disturbances which constitute one of the most characteristic manifestations of climacteric pathology are also related to the hypertension. These are usually described as hot flashes or a feeling of suffocation. The sensation of heat is sometimes followed by profuse perspiration, especially of the head and limbs, and finally by a slight chill. The relation between the hypertension and the vasomotor disturbances, however, is not that of cause and effect, as some authors affirm, because: (1) the hypertension due to other causes does not produce hot flashes; (2) the intensity of the climacteric hypertension does not parallel the intensity of the vasomotor disturbances; (3) in advanced periods of the menopause the sensation of suffocation ceases but the hypertension persists; and (4) the injection of adrenalin always produces increased arterial tension but not always vasomotor disturbances. The cause of the disturbances in question is a vasomotor instability produced by the combined action of suprarenal and thyroid hormones. For this reason hypertension due to arteriosclerosis or nephritis is not accompanied by symptoms of suffocation unless a hyperthyroid factor is present. On the other hand, it is one of the most frequent symptoms of Basedow's disease, especially if hypertension also is present. For the same reasons the suffocations are vehement during the menopause in women who have even a very slight tendency toward hyperthyroidism. The same organic base that underlies emotion and the menopause, therefore, is responsible also for these vasomotor disturbances:

i.e., the thyroid and suprarenal instability, the principal tendency being toward hyperfunction.

The vasomotor instability sometimes causes spots on the skin resembling urticaria which in many instances are localized exclusively in the region of the thyroid.

A very constant symptom of the menopause is tachycardia, either simple, without subjective sensations, or paroxysmal, with sensations of violent palpitation, oppression, anguish, etc. The pathogenic mechanism of the simple tachycardia is hyperthyroidism, and the paroxysmal type is due to a special reaction of the heart to hyperthyroidism and hyperadrenalinæmia.

Interesting phenomena at this time of life are cardiac insufficiencies, either subacute or sudden. The former occur in women with heart lesions that have been habitually compensated. It can be readily understood that the abrupt and repeated changes of tension and the intense vasomotor reactions of the climacteric might undo a circulatory equilibrium even slightly unstable. Equilibrium may be re-established in some of these cases after the crisis but not in all of them. The acute type of circulatory insufficiency comes on suddenly as an abrupt asystole, brought on sometimes by very insignificant causes. Repeated grave attacks, however, imply a lesion of the myocardium which is not due to the menopause, and this is especially true if angina pectoris is present.

Apoplexy during the menopause is rare, and when it does occur the lesions of the arteries have been present before the crisis. The same is true of arteriosclerosis. True arteriosclerosis, however, is apt to occur in women whose menopause is characterized by intense emotional states—hyperfunction of the suprarenals. In addition, hypercholesterinæmia is almost constant in the menopause because of the hyperplasia of the suprarenal cortex, and this condition also favors the production of arteriosclerosis. The menopause, therefore, is a predisposing cause of arteriosclerosis and re-enforces actively the other etiological factors.

SYMPTOMS OF THE NERVOUS SYSTEM

The nervous symptoms are prominent during the menopause and many of them are painful. Neuralgia affecting distinct nerve regions of the body is common. Migraine and headache from the hypertension may be very severe. Many women complain of pain in the bones, especially of the sacral and lumbar portions of the spine. This bone pain is due to ovarian disturbance and is amenable to ovarian therapy.

Very characteristic of the symptomatology of the menopause is a feeling of weakness or weariness. This symptom is often present in thyroid or suprarenal insufficiency and occurs during the crisis when there is primarily or secondarily a deficient production of adrenalin.

Paræsthesias are common, especially sensations of formication and numbness.

Generalized pruritis at this age is often a manifestation of diabetes, and even though there is no glycosuria a hyperglycæmia can be demonstrated in a certain number of cases.

Localized pruritis is usually vulvar. Kraurosis vulvæ is directly dependent on ovarian insufficiency.

There may be disturbances of any or all the special senses, and especially at this time the subjective phenomena of deafness begin. Dizziness of all degrees may occur at the menopause and depends upon the circulatory and nervous instability and the digestive troubles common to this period. Insomnia is often complained of and may be extreme. The pathogenic factor in the condition is hyperthyroidism. The tendency to somnolence which is sometimes present occurs in women who have thyroid insufficiency.

PSYCHIC SYMPTOMS

It is evident that the normal psychology of a woman is intimately related to her endocrine constitution and particularly to the secretion of the ovary. In adult life, therefore, the sexual psychology is dependent upon the intensity of the activity of one or another hormone group in earlier years, and upon the accidental changes which may occur in these groups in the course of time depend the morphologic and psychologic variations which are sometimes experienced. The critical age is one of the times at which such changes occur almost as a normal phenomenon. Marked psychic disturbances are therefore to be expected during the endocrine crisis of the menopause.

These can be divided into two groups. The first includes the psychic modifications which are directly dependent on the menopause and are transient. In the second group are the definite psychopathies and neuroses which may occasionally appear during the crisis. The latter are merely complications of the menopause; the former are symptoms.

Nearly all women suffer at the menopause from emotional instability, and this may be the only psychic disturbance. During the crisis all the emotional stimulants—sorrow, joy, fear, impatience—put the organism into vibration, sometimes violently. Impatience, especially, is characteristic of the psychic state of the climacteric. Indubitably this emotional state is due to the thyrosuprarenal instability of the early part of the menopause. When there is thyroid and suprarenal hypofunction depressed states are to be expected. These disturbed states, however, are evanescent and after the menopause subside to complete serenity.

The gradual diminution of the sexual impulse is normal at the menopause the function simply being abolished as the organ disappears. In the human subject this loss may make sexual relations intolerable and may be the cause of true nervous disease and many domestic infelicities. In some women whose ovarian function has been energetic there may be a state of melancholy due to the lack of

ovarian hormones which is comparable to the effect of sudden deprivation of a drug. In women who have no interests aside from their personal attractions there is often an intense fear of growing old. This psychic state may lead to religious exaltation, the wearing of clothing and the use of cosmetics inappropriate to the woman's age, the fiction of amatory episodes, or even false pregnancies.

The study of the increase of libido during the menopause is very suggestive. In this both organic and psychic factors are concerned. The organic is the internal secretion of the ovary which is discharged with great irregularity, due to the instability which characterizes the latter stages of the activity of this organ. Another organic cause are vulvar and vaginal lesions which produce local hyperæsthesia. Among the psychic factors must be considered the late or secondary romanticism which is the rock on which so many women shatter their happiness in the dangerous age. Another circumstance to be considered is masculine solicitude, many men preferring women of full maturity.

It remains finally to state that the conservation of the amorous affections after the period when they usually end is not abnormal but simply the physiological correspondence to the secretion from an ovary abnormally conserved.

In some cases at the menopause there is a tendency to sexual inversion with the appearance of general robustness, a deep voice, and hair on the face and body. The psychic state also seems to be transformed.

The psychopathies are very diverse in the critical age but relatively very rare. They occur only in women with a strongly accentuated predisposition to cerebral disease or who have suffered from dementia previously. There is nothing peculiar about the psychopathies which develop at the menopause; they are similar to those which may occur at any age. The most common are melancholia, paranoia, and manic-depressive states. All of these also are most common in hyperthyroid affections.

Among the clinical types of paranoia, erotism is usual, and religious delusions are common in Spain. Other types are dypsomania, kleptomania, etc. Melancholia during the menopause is usually preceded by a long prodromal stage and may become extreme. Manic depressive states are presented under all the clinical forms from the lightest to the most intense. The tendency to suicide is accentuated during the menopause and in syphilitic women the symptoms of paresis are apt to manifest themselves at this time.

The pathogeny of these symptoms is as obscure as anything in psychiatry but hyperfunction of the thyroid and suprarenals seems to have an important rôle in this connection. The prognosis in psychic disturbances due directly to the menopause is good, but in the true psychopathies so many individual factors must be considered that it is impossible to draw general conclusions. In general, the influence of the climacteric on pre-existing mental abnormalities

is prejudicial. Hysteria is influenced unfavorably in the earlier stages of the menopause, due to the endocrine instability of this period. Later, when the ovarian function is definitely extinguished and the other glands which take part in the crisis have become stable, hysteria decreases or even disappears. Neurasthenia stands in the same relation to the climacteric as hysteria. The age in which the climacteric occurs is not propitious for explosions of epilepsy, but pre-existing epilepsy is apt to be benefited by the crisis of the menopause.

METABOLIC DISTURBANCES

The metabolic disturbances which occur during the critical age are obesity, localized adiposis and lipomatosis, emaciation, diabetes, gout, and various types of chronic rheumatism. Some of these are symptoms of the menopause and others merely complications.

The characteristic obesity of the climacteric begins to show itself usually in the arms and shoulders and is very rebellious to treatment. The obesity varies in degree and tends rather to deformity of shape rather than to great weight. While lack of ovarian secretion and hypothyroidism each have etiological influence in the causation of this obesity, the principal factor in its development is hypopituitarism, which is a usual element in the climacteric crisis. The adiposity of the anterior abdominal wall is due to the influence of the pituitary gland while that of the hips, gluteal region, arms, breast, and neck depends upon the ovarian insufficiency. If hypothyroidism also intervenes there is general adiposis with marked increase in weight. In addition to these factors there is usually superalimentation and a sedentary life to contribute to the formation of adipose tissue.

The type of local adiposis most frequently encountered at the menopause is that of the abdominal wall which may be so excessive that it resembles a gravid abdomen. This adiposity joined to the psychic factors, such as the desire for a child, is no doubt often the basis for a false pregnancy. Adiposity of the legs is comparatively rare but that of the arms is very common.

The lipomatosis observed during the menopause is in many instances painful. The most common location is supraclavicular.

Angioneurotic oedema is not infrequent.

All the conditions named, and also the adiposis dolorosa of Dercum, are endocrine-sympathetic alterations, which fact accounts for the poor success of opotherapy.

A considerable number of women tend to lose flesh at the menopause. In the absence of digestive diseases, diabetes, cancer, etc., this thinness is characterized and may be diagnosed by its spontaneous variations and the presence of other hyperthyroid symptoms. Not so frequent and coming on later is the emaciation of hypophyseal origin.

The relation of diabetes to the menopause is very interesting. Ovarian insufficiency is a very important

predisposing factor of diabetes in that it brings on modifications in the organism which facilitate the action of the direct causes of glycosuria. This alteration is in the direction of hyperplasia or hyperfunction of the suprarenals and the thyroid and thus lowers the limit of toleration for carbohydrates. Whether or not this predisposition becomes an actual diabetes depends upon alimentation and the state of the pancreas. Clinically climacteric diabetes presents some peculiarities. Emotional states frequently figure in the etiology. Its course is slow and benign. Examination usually shows the symptoms of hyperthyroidism and hypersuprarenalism.

Gout is undoubtedly related chronologically to the menopause, about twice as many cases occurring in the decade from 40 to 50 as in any other decade. Clinically it is similar to that which occurs at any other age. It seems to correspond almost always to the syndrome of thyroid instability.

The chronic rheumatic disturbances are also undoubtedly, but equally obscurely, related to the critical age. They are more frequent in women than in men and most often make their appearance at this time. It may not be proper to speak of an ovarian type of rheumatism, but certainly ovarian insufficiency predisposes to chronic rheumatism and this predisposition is enhanced by the whole complex endocrine crisis of the menopause.

SYMPTOMS OF THE DIGESTIVE SYSTEM

During the critical age disturbances of the digestive apparatus—gastric, intestinal, hepatic—are common, but the most frequent of all are the gastric troubles. There is no constant type of gastric symptomatology during the crisis, but hyperchlorhydria and dyspepsia, with or without aerophagy, are observed most often. They appear to be manifestations of hyperthyroidism. If, on the contrary, the menopause is complicated by hypothyroidism, a corresponding hypochlorhydria will present itself. Flatulent dyspepsia is also very frequent; many women complain of a sensation of great fullness, with meteorism, eructations, etc. This condition coincides often with the development of large accumulations of abdominal fat. Meteorism in some cases may be so exaggerated and so persistent as to cause a mistaken diagnosis of pregnancy or abdominal tumor.

A pathologic appetite is not unusual and alcoholism also frequently begins at the menopause.

About two-thirds of all women have some form of intestinal disturbance during the menopause, and of these constipation is the most common. There is nothing particularly characteristic about this constipation except its rebelliousness to treatment. Diarrhoea is much less frequent but much more important pathologically. It presents itself sometimes continuously; sometimes, and more often, as a diarrhetic crisis, possibly psychic. The pathogeny of these symptoms concerns the intestinal innervation. The constipation is due to an intestinal paresis of hyperadrenalinæmic origin and in the majority

of cases occurs in women with great hypertension. The diarrhoea is vagotonic, depending upon the climacteric hyperthyroidism. If hypothyroidism is the dominant factor the tendency is also toward constipation. On the other hand, hyperadrenalinæmia, if excessive, will excite peristalsis and favor diarrhoea. Mucomembranous enteritis may complicate the menopause but is not caused by it.

Hæmorrhages may occur in the digestive apparatus during the menopause. Usually they are benign, but grave lesions must be watched for.

Pharyngeal and oesophageal spasms are neurotic affections rather common during the climacteric. Even without hyperthyroid intervention the ovarian insufficiency alone may be responsible for them.

Among the hepatic affections, a congestion of the liver manifested by a benign jaundice has been cited. The prognosis should not be made lightly, however, for cancer of the liver or of the head of the pancreas may begin with just such an icterus.

Hepatic colic is very common in the climacteric years. Since there is always a hypercholesterinæmia during the menopause the occasion is favorable to the formation of biliary calculi.

Finally, reference must be made to an affection related to genital insufficiency and therefore to the menopause—symmetrical infarct of the salivary and lachrymal glands or Mickuliz' disease. The condition is coincident with various endocrine disturbances, particularly ovarian insufficiency.

SYMPTOMS OF THE RESPIRATORY SYSTEM

Aside from epistaxis, dyspnoea due to meteorism and accumulations of fat, and the aggravation of chronic respiratory diseases during the congestive stages of the climacteric, there remains one other respiratory symptom, i. e., asthma. While this is respiratory by localization, it is really a disturbance of the nervous system. There is always at least some slight lesion to fix the disturbance in the respiratory system, but the neurosis is the important thing. Concretely, the neurosis concerns the pneumogastric nerve. The functions of the pneumogastric nerve being intimately related to the hormonal influences, it becomes evident that the internal secretions have an undoubted place in the pathogenesis of asthma.

The influence of the suprarenal glands has not yet been determined precisely. While adrenalin is effective to ameliorate the spasm, it seems that it is not a substitute treatment. Hyperthyroidism has been considered a cause of asthma because of the benefit received from antithyroid treatment. The factor most constantly related to asthma, however, is genital insufficiency.

SYMPTOMS OF THE URINARY SYSTEM

The urinary symptoms of the menopause are not numerous. The condition most frequently present is cystitis. This is usually not severe, often causing only some frequency of micturition. It is related to the thyroid instability and climacteric congestion.

Cystalgia may occur without any symptoms whatever to permit the assumption that there is a vesical lesion. Hæmaturia must be looked upon with the same reserve as other hæmorrhages at this period. Polyuria may be extreme and is perhaps related to hypophyseal insufficiency. Prolapse of the urethral mucosa pertains properly to a later age. Vesical and renal calculi are complications, not symptoms, of the climacteric.

The menopause has considerable influence upon chronic diseases of the kidney. The various types of chronic nephritis are much aggravated at this time. The excessive suprarenal function and the consequent hyperadrenalinæmia of the crisis exercise a harmful influence on the kidney.

SYMPTOMS OF THE SKIN AND HAIR

The skin suffers various affections during the menopause, the most common of which is eczema. Clinically it is similar to the eczema of other ages and is due to the menopause only indirectly although some of the internal secretions seem to have a part in it.

Acne rosacea, rare in youth, is very common in the fifth decade and almost always is seen in women. An endocrine factor may intervene here also. Erysipelas and furunculosis are not infrequent, especially if the patient has had attacks before. Urticaria is often observed in cases in which the ovarian insufficiency is accompanied by dysthyroidism. Herpes zoster is often seen but its relation to the crisis is not determined. Hyperhidrosis may occur even in women who have never perspired much previously.

In many cases the menopause is accompanied by the appearance of dark pigmentations in the skin. These are not found in the same areas as the pigmentation in Addison's disease, and their origin, as in pregnancy, is purely genital.

Hypertrichosis is an interesting manifestation of the menopause observed in practically every woman. It may be very light and yield easily to cosmetics, but in some cases is abundant and the hairs are very coarse. In general, it is more marked in brunettes than in blondes because the former, as a type, have an endocrine constitution in which the disturbances causing hirsutism take place easily. The symptom is a manifestation of the tendency toward virilism induced by the hyperplasia of the suprarenal cortex. The hypophysis also takes some part in its production.

Whitening of the hair is a symptom of old age, but usually begins early in the critical age. Premature whitening of the hair, however, often coincides with prolonged conservation of physical and mental youth, and therefore of menstruation. Hyperthyroidism is the principal factor in this phenomenon.

SOME SPECIAL CLINICAL FORMS OF PATHOLOGIC MENOPAUSE

All the symptoms enumerated present themselves in certain characteristic groups as one or another glandular factor predominates, and these groups

can be classified as clinical forms of the pathologic menopause. The principal types are the hyperthyroid, the hypothyroid, the suprarenal, the pituitary, the genital, and climacteric polyglandular sclerosis.

The hyperthyroid form is very common and very characteristic. It differs often from Basedow's disease in that there may be no demonstrable goiter and no exophthalmos, but tachycardia is very frequent and tremor is observed in almost all cases although it may be absent if there is no hypertension. Emaciation is very important and often is the final symptom of this type of hyperthyroidism. The digestive disturbances of Basedow's disease are present, especially diarrhoea. Vasomotor disturbances are pronounced because of the collaboration of the suprarenals, and the local vasomotor-hyperthyroid reaction is quite constant. The emotions are usually intense and the psychic symptoms accentuated. The chief characteristic of this type of hyperthyroidism is that it is very acute and usually temporary. The prognosis, in general, is good. It is the most amenable to medical treatment of all the forms of hyperthyroidism. Surgical interference is very rarely necessary.

In women with goiters strumitis is apt to occur at this time because of the circulatory disturbances present.

The hypothyroid form is much less common, but may be so pronounced that it can be called properly a climacteric myxedema. It appears in three forms: an accentuation of a light hypothyroidism present since childhood, a preliminary hyperthyroidism in cases of former hypothyroidism, mixed with and finally superseded by an aggravated myxedema; and a rapid transformation of a previous hyperthyroid state to a myxedematous condition. This extreme condition is rare. More commonly thyroid insufficiency manifests itself by obesity, chilly sensations, apathy, headaches, constipation, etc.

A mixed type due to fluctuations in the thyroid activity is also possible.

The suprarenal form is due to the marked predominance of the suprarenal factor. There is corpulency, plethora, hair on the upper lip, cheeks, and chin, hypertension with all its subjective symptoms, tremor, and a tendency to diabetes. Two types can be distinguished: (1) medullar hyperfunction, causing the hypertonic type, with hypertension, hyperglycemia, tremor, etc., and (2) cortical hyperfunction with virilism.

The pituitary form is characterized by increase of abdominal fat and early cessation of the menses. The accompanying genital insufficiency causes adiposity of the hips, mammary region, etc. The woman is usually apathetic and indolent. Lipomatosis dolorosa and angioneurotic oedema are common.

In the genital form the ovarian factor predominates. There may be persistent and repeated hæmorrhages and severe psychic disturbances, especially of the sexual feeling.

Polyglandular sclerosis occurs in a certain number of women of asthenic habit and culminates in premature senility.

ARTIFICIAL MENOPAUSE (SURGICAL)

The so-called surgical menopause is clinically the expression of an abrupt total ovarian insufficiency. The spontaneous menopause is a polyglandular crisis of which the gradual ovarian insufficiency is the nucleus surrounded by various other endocrine reactions. This accounts for the clinical difference between them and for the fact that the difference is greater if the operation is done in youth than when it is done in maturity. Early castration, therefore, is more apt to present evidences of hypofunctional reactions (especially hypothyroid; less often hyposuprarenal), but hyperfunction of the pituitary. If the complementary glandular reaction is in general much less marked in women operated upon early in life, however, the symptomatology dependent upon the ovarian insufficiency may be accentuated, depending upon the extent to which the ovary was previously diseased.

For the prognosis of the postoperative disturbances, therefore, the proximity of the operation to the critical age, the degree of integrity of the extirpated ovaries, the previous endocrine state, and the psychic state must be taken into consideration.

The symptomatology is, in general, the same as that of the spontaneous menopause, with variations in the frequency, mode of presentation, etc., of certain of the symptoms. The symptoms may occur as early as the tenth day or as late as the third week after operation, depending upon factors peculiar to the individual case. In some cases there may be no symptoms at all.

The genital symptoms consist of definite suppression of the menses with persistence of their subjective disturbances. If menstruation persists it is safe to assume that some ovarian tissue was left or that there are accessory ovaries. The alteration of the external genitalia progresses very slowly. The breasts often atrophy, although occasionally they may hypertrophy. Leucorrhœa may be intense and sometimes periodical, but vicarious hæmorrhages are rare.

Of the usual circulatory symptoms, hypertension is absent but the vasomotor phenomena occupy an important position, and in almost every case in which hot flashes are experienced other symptoms indicative of a frank hyperfunction of the thyroid are present. Nervous urticaria and simple tachycardia also are frequently observed.

Among the nervous symptoms, the painful phenomena, i.e., bone and muscle pains, headaches, abdominal pain, are common as is also a feeling of weakness. Local and generalized pruritis are quite frequent. Vertigo is rare.

The psychic alterations are comparatively rare. Emotional instability is less frequent and less intense. Diminution of libido is a normal phenom-

non after ovariectomy. The tendency to sexual inversion is not observed in those who are operated upon young.

Of the psychopathies, melancholia associated with loss of memory is the most common. Loss of memory, however, may occur alone.

Increase in weight is a common consequence of ovariectomy, especially when the operation is done early, and Dercum's disease is by no means rare. Diabetes does not occur in these cases since ovarian insufficiency is only a predisposing and not a direct cause of the disease. Arthritis deformans is unusual. Digestive, respiratory, urinary, and skin disturbances are similar to those in the natural menopause.

THE CRITICAL AGE IN MEN

Men also have a critical age, for this is an unavoidable phenomenon in the evolution of every human being.

The climacteric in men differs biologically from the climacteric in women in that it is more diffuse and less characteristic. The pathogenic differences are of two types: endogenous (endocrine) and exogenous. In the female the climacteric is characterized by ovarian insufficiency and the collateral reactions of the thyroid (generally hyperthyroidism), the suprarenals (generally hypersuprarenalism) and the hypophysis (hypopituitarism). In the male these reactions are equally distinct. In man the critical age coincides with testicular insufficiency, but this comes on much less abruptly than ovarian insufficiency, and psychically the annulment of the genital activity is less marked in the male because the affectional life for him is secondary to his work-day affairs.

The thyroid reaction so important in the climacteric of the woman is much less marked in the man. Nevertheless the climacteric hyperthyroidism may appear in the male also, and is characterized especially by loss of weight and psychic disturbances.

The suprarenal reaction, on the other hand, is as frequent and as intense in men as in women. The hyperfunction of the cortical portion brings on corpulence and an increase of the beard and body hair. The medullary hyperfunction is manifested by arterial hypertension. Tremors, hyperglycæmia—the whole suprarenovascular syndrome—are present with the same frequency as in women. It is probable also that the pituitary intervenes in the climacteric crisis of men, causing senile atrophy or peculiar adiposities.

The exogenous factors are also distinct in the male. He is more frequently exposed, however, to certain pathologic processes which act selectively upon the circulatory and the nervous systems.

The genital symptoms in the male are very simple—progressive diminution of the erectile activity of the external genital apparatus until it is entirely gone.

The fundamental manifestation of the circulatory symptomatology is hypertension due to hyperadren-

alinæmia. Because of the exogenous factors mentioned this is very apt to lead to vascular lesions. Accordingly angina and apoplexy are more common in men than in women. Xanthelasma and arcus senilis are indications of hypercholesterinæmia. The vasomotor symptoms are seldom if ever observed in men.

Of the nervous disturbances, neuralgias are common. Generalized pruritis and sensory disturbances are also often present.

The metabolic symptoms are quite similar in the two sexes, as are the digestive, respiratory, and cutaneous symptoms. Among the urinary symptoms may be included the troubles of prostatic origin which probably are related to the diminution of the internal secretion of the testicle.

The symptoms in the psychic sphere most especially characterize the critical age in the male. Emotional instability is frequent although less intense than in the female. Impatience, the tendency to be easily irritated, is another common sign of the climacteric in the male. The diminution of the sexual impulse rarely reaches pathologic limits. In place of the grief over departed youth so common in women, the man often feels maltreated, ignored, or forgotten by the succeeding generation, this feeling varying in degree from a simple pre-occupation to actual delusions of persecution.

The pathologic increase of sexual feeling in the male is quite common at the climacteric and the disharmony between the increase and the decreased sexual aptitude is the cause of much trouble.

The final psychological sign of the climacteric of the male is his evolution toward the conservative. As the sexual declination comes on, and with it the reduction of the other vegetative activities, the masculine morphology acquires an aspect of repose and a characteristic accentuation of the abdominal curve. His artistic, scientific, or professional production loses its warmth and juvenile arbitrariness, and in thought and in political action the conservative attitude is accentuated.

Of the psychopathias properly so-called the most characteristic is involutional melancholia. The various types of paranoia observed in women present themselves also in men. Of the neuroses, neurasthænia (the "run-down" condition of the Americans) is very common in men at this age.

PATHOGENIC TREATMENT (OPOTHERAPY); GENERAL HYGIENE AND DIETETICS

The fundamental indication for all the disturbances related to the extinction of sexual function is ovarian opotherapy, but thyroid and antithyroid, suprarenal, and pituitary treatment must also be considered as well as dietetics and general hygiene.

From the beginning of the first symptom of the climacteric until the last has disappeared, ovarian medication is indicated, and any other necessary medication (tonics, sedatives, etc.) is compatible with it. Two preparations are available: the total ovarian extract and the extract of the corpus luteum.

Corpus luteum opotherapy is indicated in cases which present disturbances of the menstrual function only. These, however, are not usual in the critical age and therefore as a general rule extracts of the whole gland should be used. The dessicated extracts are preferable and it is usually best to give them by mouth. The dosage depends upon the requirements of the case. These are not constant, but variable from one phase of the critical period to another. In general the results of ovarian opotherapy in the menopause are excellent.

The indications for the other organotherapeutic agents depend upon a minute study of the endocrine symptomatology presented. Thyroid therapy is contra-indicated in women with predominantly hyperthyroid symptoms (tachycardia, palpitation, etc.), but here the antithyroid serum is indicated. In the group which presents evidences of thyroid instability thyroid extract should be given in very small doses. When the symptoms are frankly hypothyroid, the full thyroid opotherapy is necessary.

In the vast majority of cases the phenomena of hyperfunction of the suprarenals predominate and suprarenal medication is consequently contra-indicated. Recourse should be had, therefore, to symptomatic treatment to reduce the arterial tension. The suprarenal treatment is desirable in those rare cases showing hypotension, asthenia, pigmentation, etc.

Almost without exception the pituitary symptoms of the menopause are hypofunctional. Accordingly, hypophyseal treatment is urged in cases of premature amenorrhœa with rapid increase in weight and localization of fat in the abdominal region.

Mammary, parathyroid, biliary, and pancreatic opotherapy have occasional symptomatic indications during the critical age.

Even when there are no important complications during the menopause the diet should be as little toxic as possible, predominantly vegetarian, and not large in amount. As usually the patient inclines to a sedentary life, systematic exercise should be prescribed. Travel also is beneficial. Massage, electrotherapy, radiotherapy, etc. have their occasional uses. Outside distractions are highly desirable.

The monograph is concluded with a discussion of symptomatic treatments and an extensive bibliography.

M. M. MATTHIES.

Lockyer, C.: Lipoma of the Broad Ligament.
Proc. Roy. Soc. Med., Lond., 1919, xii. Sect. Obst. & Gynec., 195.

The author reports a lipoma of the broad ligament which he discovered while operating for an ovarian dermoid cyst on the opposite side. From his study of this case he concludes that the fat which he found in the mesosalpinx represented a true lipoma and was not merely an excessive subserous deposit of fat such as may be seen in some cases of malignant disease or the result of a transudation of dermoid grease from the adjacent intact cystic teratoma.

True lipomata of the broad ligament are rare, a fact which is easily explained by the scanty supply of fat in this retroperitoneal situation. Lockyer has found the records of nine cases. Seven of these were true lipomata. The remaining two were dermoid cysts with distension of the mesosalpinx by some form of fatty material.

C. H. DAVIS.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Bar, P., and Egalle, G.: Recent Biological Discoveries and the Diagnosis of Pregnancy (*De l'utilisation pour le diagnostic de la grossesse des récents découvertes biologiques*). *Arch. mens. d'obst. et de gynec.*, 1919, viii, 372.

The authors have studied the value of recent biological methods for the diagnosis of pregnancy, viz., complement deviation, the method of Abderhalden, and the intradermal method. They have endeavored also to determine what may be deduced in the course of pregnancy from the antitryptic power of serum and the activating power of cobra venom.

As regards the method of complement deviation, their research has led them to reiterate the conclusion reached and reported in 1912, i.e., that the practical value of the method from the viewpoint of the diagnosis of pregnancy is very slight.

Abderhalden's method of dialysis was tested with serum obtained from 210 normal pregnant women and 100 non-pregnant women. It was found that the serum of pregnant women contains anti-placental proteolytic ferments and always gives a positive reaction. In the case of non-pregnant women a positive reaction was observed in 33 per cent of the cases, these results being obtained especially in women with some genital lesion, adnexitis, tumors, etc. The authors agree with those who, while according a real theoretical value to the presence of proteolytic ferments in the serum of pregnant women, recognize the fact that in practice the method may lead to an erroneous diagnosis.

In the next part of their article the authors deal with pathologic pregnancy and the results found with the dialysis method in cases of death of the foetus, retention of the placenta, extra-uterine pregnancy, eclampsia, etc. The conclusions are summed up as follows:

1. In cases of retention of the placenta the serum of the pregnant woman always gives a positive reaction. This reaction, the intensity of which seems to be influenced little by the duration of the pregnancy, appears in the first or second month of gestation and in the majority of cases disappears within three weeks following delivery. In cases of extra-uterine pregnancy the reaction is always positive when the ovum is living, and may be negative when the ovum is dead. In the different types of intoxication of pregnancy it is generally much diminished and may disappear entirely.

2. The serum of non-pregnant women may split the placental albumin or have no action upon it. It therefore may give either a positive or a negative reaction. Positive reactions were obtained

in 33 per cent of the cases studied. These positive reactions, however, are most marked in cases of genital tumors when there is resorption of a hæmorrhagic or purulent collection. The failure of the method may be attributed to: (1) the technical complexity of the reaction, which is subject to numerous causes of error, and (2) the possible presence in the sera of non-pregnant women of proteolytic ferments which do not present an absolute specificity in the presence of the particular albumin against which they have been formed but are able to attack other albumins such as the albumin of the placenta.

The general conclusion as regards the Abderhalden method is that while a negative result eliminates the hypothesis of a pregnancy in evolution, a positive result in no way affirms its existence.

As regards the intradermal method the conclusion drawn is that, at the present time, nothing definite as to the diagnosis can be obtained from it.

In their study of the general protein reactions during pregnancy the authors found that the antitryptic power of serum is generally increased. Such a determination would be of little aid in the diagnosis of a doubtful pregnancy, however, unless a very detailed examination were made in addition.

The clinical benefit of cobra venom appears to be only mediocre and entirely out of proportion to the work necessary, but the results are such as to encourage further research.

W. A. BRENNAN.

Schiller, H.: The Estimation of Fats, Cholesterol, and Sugar in the Blood of Thirty Pregnant Women. *Surg., Gynec. & Obst.*, 1919, xxix, 450.

The author gives a résumé of the recent literature and shows the results of his own experience in tabular form.

"To determine the cholesterol, the fat and blood-sugar content of the blood, I examined the blood of 14 pregnant women in the later months of pregnancy, 10 at term, 5 after partus, and 1 in the third month of pregnancy. In doing this I was well aware that similar examinations had been made by much more competent men than myself, but I had in mind studying these three substances parallel with each other in the same blood, a research which, to my knowledge, had not previously been made."

From his study and the literature he comes to the following conclusions:

1. There is no hyperglycæmia in the later months of pregnancy or in the first two weeks after pregnancy.

2. Glycosuria and alimentary glycosuria during this period can be explained by the activity of the glands of internal secretion or as a renal hyperfunction.

3. Hyperlipæmia in pregnancy is in reality for the most part a hyperlipoidæmia.

4. There is no parallelism between cholesteræmia and hyperglycæmia in pregnancy.

5. The etiology of this condition is not as yet established.

6. It seems that the endocrine glands are to be looked upon as an important factor. C. H. DAVIS.

Van Cauwenberghe, A.: Premonitory Signs of Eclampsia (*Recherche des signes précurseurs de l'éclampsie*). *Rev. franç. de gynéc. et d'obst.*, 1919, xiv, 294.

On the basis of the study of several cases of eclampsia Van Cauwenberghe calls attention to two points: (1) the importance of digestive disturbances in the pregnant woman, and (2) the great benefits resulting from venesection when eclampsia is threatened.

The theories advanced recently by Jarzew of Moscow have brought these points into prominence. Jarzew ascribes the low mortality from eclampsia in Russia to the fact that the food of the Russians is relatively poor in albuminoids. An accumulation of albuminoids in the blood increases its viscosity and this in turn results in an increase in the arterial tension, cerebral congestion, and an increase in the quantity of cerebrospinal fluid, i.e., high intracranial pressure and convulsions.

On the basis of this theory, therefore, it is evident that venesection is of great value in eclampsia not only because it increases the fluidity of the blood and reduces the arterial pressure, but because it decreases the excess of albuminoids in the organism which cause an intoxication. Premature labor is also favorable owing to the change effected in the circulation by the decrease in the size of the uterus.

There is no certain means of foreseeing eclampsia as symptoms may be lacking and the urinalysis negative. Attention should therefore be directed to whatever else beside the classical signs might suggest the condition. Digestive disturbances in general and uncontrollable vomiting in particular may suggest it.

Venesection should be done in all suspicious cases and natural losses of blood should not be hindered as long as they do not exceed the amount of an ordinary blood-letting. Pituitrin is contra-indicated.

W. A. BRENNAN.

Loomis, F. M.: The Possible Relationship of Dental Abscesses and the Toxæmias of Pregnancy. *California State J. M.*, 1919, xvii, 399.

It has been repeatedly noticed that the woman who has an early toxæmia, such as the more persistent type of vomiting, is apt to have evidence also of late toxæmia, and since localized infection anywhere means the absorption of toxins, it seems reasonable to believe that the irritation of chronic sepsis may be at least one of the factors in decreasing the ability of the liver and kidneys to carry the normal overload of pregnancy.

Chronic dental sepsis is present in many pregnant women. Of 125 devitalized teeth in one series of cases, 103 were found infected. Possibly 50 per cent of devitalized teeth are septic sooner or later.

The author presents several strikingly suggestive cases of immediate subsidence of the symptoms of pre-eclamptic toxæmia following the removal of dental abscesses. In one instance the blood pressure dropped 30 points in twenty-four hours, the œdema disappeared at once, and the patient, who was definitely toxic, went on to a normal delivery. Another patient, a primipara four and one-half months pregnant, who had headache, nausea, albuminuria, and rising blood pressure, was completely relieved by the removal of 5 unsuspected dental abscesses and the pregnancy continued normally. This patient had never suffered from local symptoms such as toothache.

Several cases of postpartum psychoses and hyperemesis gravidarum which were apparently relieved or improved at once by the removal of abscesses, are also reported. It is not claimed by the author that dental sepsis is the cause of eclampsia. He believes, however, that every pregnant woman should have all devitalized teeth X-rayed and all definite abscesses removed in whatever stage of pregnancy they may be found, even up to the ninth month if the patient is toxic. Vigorous curetting of the abscess cavity should, of course, be avoided.

Ley, G.: Two Cases of Full-Time Extra-Uterine Pregnancy, with a Tabulated Abstract of 100 Cases from the Literature. *Proc. Roy. Soc. Med.*, Lond., 1919, xii, Sect. Obst. & Gynæc., 140.

Case 1. The patient was 36 years old and had given birth to a child fourteen years before. Menstruation was regular until December, 1911. It then stopped until October, 1912, when there was a considerable loss of blood. This was followed for three months by no loss and then the re-establishment of normal menstruation. From December until October the patient had had no pain. There was some vomiting, however, in the early part of the period and the abdomen had enlarged to a greater size than in her first pregnancy. After the excessive bleeding in October the abdomen decreased in size but the lump persisted. Three months before admission to the hospital, June 15, 1918, she complained of loss of weight and pain in the back.

Examination revealed a hard mass of fetal shape lying transversely across the mid- and lower abdomen. Grating was felt upon palpation. Vaginal examination showed a normal cervix and lower segment, and a soft mass filling the cul-de-sac. The fundus was not made out.

The gestation sac was removed with the left tube and ovary.

On examining the specimen it was found that the left tube was connected with the mass and apparently terminated within it. The sac contained a compressed but well-preserved fetus. In Ley's

opinion this was therefore a clear case of secondary abdominal pregnancy following tubal rupture.

Case 2. The patient had been married over three years and had had no children or miscarriages. Nine months before admission to the hospital menstruation had stopped and six weeks afterward she had suffered severe pain with temperature from 90 to 100 degrees. Later she had two less severe attacks. Foetal movements were felt up to the time of admission. The patient was underweight and slightly jaundiced and had a temperature of 100.4 degrees F.

On examination an abdominal tumor, tender and definitely cystic, was found lying to the right and extending up to the level of the costal margin. There were no foetal heart sounds or movements. To the left and below was another mass which contracted. The cervix, which was large and soft, was pushed to the left by a soft mass in the vault.

Laparotomy showed the uterus pushed to the left and the size of a ten-week's pregnancy. The left tube was tortuous and open and the left ovary normal. To the right was a large mass covered by peritoneum and crossed by the right round ligament. The tube was lost in the mass.

A supravaginal hysterectomy was done and the sac with the foetus extirpated, leaving the left tube and ovary undisturbed. The patient recovered, but developed a right ureterocervical fistula.

The uterus contained decidual cells, and in the sac was a macerated foetus which weighed $4\frac{1}{2}$ lbs.

In reviewing 100 cases reported in the literature in which pregnancy had continued for more than thirty-four weeks, Ley found that 77 per cent went to term. The pregnancy was normal in 33 per cent of the cases. In 50 per cent there were abdominal symptoms, probably at the time of rupture or hæmorrhage. In one case eclampsia developed during labor. In 3 per cent of the cases there was extra- and intra-uterine pregnancy. Seventy-four of the patients were not operated upon and there were no complications. In 33 per cent there were symptoms of infection. These symptoms occurred as early as ten days and as late as fifteen years after labor or the death of the foetus.

The author concludes that in cases of extra-uterine gestation at or near term operation should be performed, if possible, during the life of the child, and, on account of the risk of infection, even after the death of the foetus. If possible also the sac should be removed; if not, marsupialization should be done with drainage after the removal of the placenta.

M. J. GELPI.

White, C.: A Case of Full-Time Pregnancy in a Rudimentary Uterine Horn. *Proc. Roy. Soc. Med.*, Lond., 1919, xii, Sect. Obst. & Gynæc., 138.

The patient, who was 20 years old, had had one child. Menstruation had been regular for two years when it suddenly stopped. Eight months afterward there was a bloody discharge but foetal movements were felt for another month. There was no marked

pain. Three months later a bougie was inserted and the cervix dilated under anæsthesia. The uterus was small and empty but at the right was a mass the size of the gravid uterus at term. Cæsarean section revealed a dead full-sized male foetus. Hysterec-tomy and a right salpingo-oöphorectomy were done. There were no signs of impending rupture. The patient made an uneventful recovery.

The specimen consisted of the body of the uterus, the gestation sac, and the right tube and ovary. The uterine body contained decidual cells. The placenta was situated on the uterine side. The ovary contained a corpus luteum. The tube appeared normal. From the position of the gestation sac relative to the uterus and the round ligament it would appear that the specimen represented a pregnancy in a rudimentary horn. M. J. GELPI.

MISCELLANEOUS

Beruti, J. A.: The Possible Uses of Diathermy (Thermopenetration) in Obstetrics (Posibles aplicaciones de la diatermia (termopenetración) en obstetricia). *Semana med.*, 1919, xxvi, 118.

In view of the physiological effects of diathermy and its successful use during years of clinical experience in other specialties, Beruti considers it desirable that its usefulness be extended to include obstetrics for in this field are encountered certain conditions which it might be logically inferred would react favorably to this form of treatment.

As a means of inducing abortion Beruti believes diathermy would not have any advantages over the ordinary surgical procedures and would be attended by greater risk of hæmorrhage and failure in the progressive mechanical dilatation of the uterus.

As regards the stimulation of uterine contractions during labor, he states that in spite of certain favorable reports of the use of direct thermopenetration for this purpose, he is of the opinion that the method is not yet sufficiently perfected and would endanger both the mother and child. He suggests, however, that it would be justifiable to try it at a distance from the uterus as an adjuvant.

Another condition in which diathermy might be applicable is eclampsia. Since in this condition renal function is disturbed, since strong hyperæmia may produce a very beneficial diuresis, and since thermopenetration of the kidneys, though difficult, is practicable, it is logical to assume that the procedure would be a very valuable addition to the treatment. The good effects of decapsulation of the kidney are due to the modification of the renal circulation so produced. Such modification might be produced by diathermy without the dangers of an operation. The objection may be raised that there would be danger of burning an unconscious patient, but while this cannot be denied, there is little risk if the treatment is given carefully.

Good results might be obtained from diathermy also in pre-eclamptic states but the development of the uterus would make the application difficult.

General diathermy has given very good results in hypothermic conditions. Accordingly there is reason to suppose it would be valuable for athrepsy of the new-born, as has been suggested, and for the treatment of premature infants and the asphyxia of the new-born. It would probably be efficacious also in cases of exhaustion and shock following profuse hæmorrhages, for it is evident that in these conditions there is a violent disturbance of the thermoregulatory apparatus of the body.

Finally the author suggests that diathermy might be useful for the chills of puerperal infection and those following the intravenous injection of certain sera, etc. M. M. MATTHIES.

Deluca, F. A., and Widakowich, V.: What is the Origin of Univitelline Twins? (¿Qual es el origen de los gemelos univitelinos?) *Semana méd.*, 1919, xxvi, 355.

Among the various hypotheses which have been advanced to explain the occurrence of univitelline twin pregnancy is that of Broman who claims that a normal ovum or perhaps an ovum with two nuclei is penetrated by a spermatozoön with two pairs of centrosomes. Other obstetricians have claimed that such pregnancies are more common in luetic families than in others. Putting these two hypotheses together, the conclusion arrived at would be that the fathers of univitelline twins have more spermatozoa with two pairs of centrosomes than men who are not syphilitic.

According to Broman's hypothesis the moment of alteration must be looked for in a very early stage of development when there are two or more blastomeres. The entrance of a spermatozoön with two pairs of centrosomes into a normal ovum gives rise to tetrapolar mitosis which causes the formation of four blastomeres which in turn develop into two individuals, joined or not joined. It is a known fact that the mature ovum grows from the centrosome and that the centrosome is carried by the spermatozoön. If a normal spermatozoön with two centrosomes penetrates an ovum, a bipolar mitosis develops. A spermatozoön with two tails, and therefore two pairs of centrosomes, would provoke tetrapolar mitosis. This theory seems to the authors the most reasonable of all so far advanced.

On examining a great many specimens of seminal fluid a certain number of two-tailed spermatozoa were found in every specimen that contained spermatozoa, but they were much more numerous in the seminal fluid of syphilitic than in that of normal men.

Although some healthy men were found whose seminal fluid contained only one or two two-tailed spermatozoa to the thousand, the average was certainly a great deal higher than this. Considering as healthy the men who were fathers of well-grown robust children, the authors found that the two-tailed spermatozoa in such cases averaged 6.12 per cent. In another group who had not had chil-

dren but were apparently healthy the average was 5.03 per cent. The largest number in the case of an apparently healthy individual was 12 per cent. The average in the seminal fluid of men with clinical syphilis was 13.13 per cent, and in that of men with hereditary syphilis, 32 per cent. The largest number in the case of a luetic individual was 72 per cent.

The vitality of these anomalous forms is not less than that of the normal, as was shown in a microscopic field in which all the spermatozoa were immobile except one with two tails which was extremely conspicuous because of its motility. The probability that in the cases of syphilitics a two-tailed spermatozoön will fecundate any ovum is increased also by the fact that seminal fluids which contain them contain also many others showing various types of deformity, such as spermatozoa with two heads and one tail, two heads and two tails, three heads, etc., and all these swim poorly because of the resistance offered by their heads.

The conclusions drawn are as follows:

1. The theory of Broman, according to which the fecundation of a normal or binuclear ovum by a spermatozoön with two tails is the cause of univitelline pregnancy, is theoretically well founded.

2. The fact that univitelline twins occur most frequently in syphilitic families and the greater frequency of spermatozoa with two pairs of centrosomes in syphilitics, corroborate the hypothesis of Broman. M. M. MATTHIES.

McQuarrie, J. G.: Foetal Death: A Study of One Hundred and Nineteen Deaths in a Series of Cases. *J. Am. M. Ass.*, 1919, lxxiii, 1574.

This report covers a series of 2,717 deliveries in the University of California Hospital. Two thousand, two hundred and fifteen of the patients were delivered in the hospital and 502 at their homes. Estimating the period of possible viability (the thirtieth week) to twelve hours after delivery, there were 97 foetal deaths. Within these limitations the foetal mortality was 3.6 per cent. In addition, 22 foetal deaths which occurred between the fifth and sixth months brought the total number up to 119 (4.4 per cent).

Chief among the causes of death were syphilis, birth trauma, toxæmia, foetal abnormalities, prematurity, and placenta prævia.

Syphilis: In this group were 15 cases (15.5 per cent). All of these mothers had treatment for syphilis during pregnancy. The cases were diagnosed from strongly positive Wassermann tests in the case of the mother, syphilitic changes in the placenta, or definite syphilitic lesions in the foetus. The placenta was examined microscopically in the entire group. In 17 cases (17.5 per cent) the evidence found at necropsy was not sufficient to establish a definite diagnosis. Ten of the infants were macerated. In the author's opinion 80 per cent of this group were really syphilitic.

Birth trauma: The 36 cases included in this group (37.1 per cent of the total) are classified as follows:

Deaths due to:

Prolapse of the cord.....	9
Low and mid forceps.....	8
High forceps.....	5
Prolonged labor.....	3
Breech presentation.....	5
Version and extraction.....	3
Asphyxia due to delayed delivery after signs of danger were apparent.....	3

It is possible that in 4 cases different treatment would have saved the babies. One patient received 1 c.c. of pituitrin during the first and second stages of labor but subsequently the use of high forceps was necessary. In the case of another patient labor lasting six days was followed by manual dilatation of the cervix and a difficult forceps extraction. In another case the use of low forceps was necessary after pituitrin had been given three times. The remaining patient, who had a flat pelvis, was delivered under scopolamine-morphine anaesthesia.

Toxæmia: Under this heading are grouped 9 cases (9.2 per cent of the total mortality) in which some disturbance in kidney function, toxæmia, or eclampsia either caused premature labor or gave definite indications for the termination of pregnancy. A prenatal clinic is maintained at the University of California Hospital in which the patient is seen every two weeks but in some instances the toxæmia developed so rapidly that a threatening eclampsia escaped prenatal observation.

Fœtal abnormalities: This group comprised 8 cases (8.2 per cent) in all except 1 of which the child was still-born. The single exception was a hydrocephalic child which made respiratory efforts during extraction.

Prematurity: There were only 5 cases in this group after deducting those mentioned previously. All of the babies survived a few hours after birth and autopsy showed no other abnormality than atelectasis.

Placenta prævia: There were only 2 cases in which hæmorrhage occurred before manifestations of labor.

Various causes: These included 1 premature separation of a normally implanted placenta, 2 cases of premature rupture of the membranes (1 of these ruptured one month before delivery and the infant died of an infection which ascended through the cord), 1 case of abdominal pregnancy, and 1 case of cord hæmorrhage due to slipping of the cord ligature in the case of a seven-months' infant delivered by cæsarean section because of placenta prævia. In general, this series showed an equal division between primiparæ and multiparæ.

The article contains several tables showing the presentation, the relation of the number of pregnancies to fœtal death, and the age of the mother. The general classification of the total number of cases is as follows:

CAUSE AND PERIOD OF ONE HUNDRED AND NINETEEN FÆTAL DEATHS

Cause	Under Over		Per- centage	Williams in 10,000 cases
	30 weeks	30 weeks		
Syphilis.....	0	15	15.5	26.4
Unknown.....	5	17	17.5	18.0
Birth trauma.....	0	36	37.1	17.6
Toxæmia.....	4	9	9.2	6.5
Fœtal abnormality.....	1	8	8.2	3.4
Prematurity.....	2	5	5.3	7.1
Placenta prævia.....	2	2	2.0	3.1
Various.....	8	5	5.2	11.2

Total..... 22 97 100.0

H. K. GIBSON.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Forni, G.: The Course of Tuberculosis in a Kidney after Removal of the Opposite Kidney (Sul decorso della tubercolosi in un rene dopo l'asportazione del rene opposto). *Arch. ital. di chir.*, 1919, i, 85.

Although the amount of experimental work on renal tuberculosis reported in the literature is enormous, Forni was struck by the paucity of reports regarding the influence of nephrectomy on the course of tuberculosis in the retained kidney. He was interested in the question whether or not the hypertrophy after removal of a kidney affects the remaining diseased organ beneficially. He reviews the experimental work which relates to this question and cites several authors, Uffreduzzi in particular, who produced bilateral renal tuberculosis by direct injection of a pure culture of tubercle bacilli into the renal parenchyma. Uffreduzzi found that animals upon which a unilateral nephrectomy was performed lived longer than control animals and in some cases the progression of the disease process in the remaining organ was very gradual. In several instances there was a regression, partial or total, which resulted in a clinical cure, healed lesions being found at autopsy.

Clinically it has been noted that vesical tuberculosis is benefited by the removal of a tuberculous kidney. Several authors are quoted also who report on the favorable effects of nephrectomy in cases of bilateral renal tuberculosis. Removal of the more diseased kidney is sometimes followed by regression of the process in the other organ, life is prolonged, and occasionally there is complete recovery.

Forni has attempted to reproduce experimentally the conditions found in man when operative intervention on the more extensively diseased kidney is indicated, and has endeavored to follow the changes in the gross and microscopic picture which ensue in the retained tuberculous kidney after nephrectomy. Tubercle bacilli of both human and bovine types were injected into the kidneys directly and proper control animals were used. Nephrectomy was performed after from thirty to sixty days. The kidneys retained were studied in the different animals at intervals of thirty, sixty, and ninety days, and accurate gross and microscopic descriptions were recorded. These are given in detail in this article, together with several colored illustrations.

The author's results and conclusions may be summarized briefly as follows:

The removal of one kidney means an increased blood supply, an active hyperæmia, for the remain-

ing kidney. An organ rich in blood is less susceptible to tuberculous infection than an organ with a poor blood supply. Nephrectomy is well borne by most animals. In general it may be stated that the compensatory hypertrophy with hyperæmia has a favorable influence on the tuberculous lesion in the remaining kidney. Comparing the kidneys with those of the control animals, it was noted that the tuberculous lesions were less diffuse in the former and more circumscribed, showing less tendency to cavity formation and a greater tendency to connective tissue production and sclerosis. There may be no regression of the lesions but they tend to remain localized. In the guinea pig and rabbit nephrectomy has a beneficial influence on the remaining tuberculous kidney, and in the evolution of the tuberculous process there is an arrest of extension with the appearance of fibrous tissue formation and sclerosis demonstrating a tendency to cicatrization and healing. These results are in accordance with clinical reports, and therefore it appears that removal of the more diseased organ is not contra-indicated in bilateral renal tuberculosis.

I. F. VOLINI.

Berry, F. B.: Report of Three Cases of Combined Tumors of the Kidney in Adults. *J. Med. Research*, 1919, xl, 459.

Mixed tumors of the kidney in the adult are rare and of an entirely different character from those which arise congenitally.

The tumors reported here, the author states, should not be confused with the more common embryonic mixed tumor of the kidney in children, which is the usual type of renal tumor in children but extremely rare in adults.

Of the three growths herein described, the first contained the elements of a fibrosarcoma and an adrenal-cell carcinoma; the second was a combination of a fibrosarcoma and a papillary adenocarcinoma; and the third an adrenal-cell carcinoma and a leiomyosarcoma. During the past twenty years but four such cases passed through the pathologic laboratory of the Boston City Hospital: the three described by the author and that of a man 51 years of age in whose case autopsy showed an adrenal tumor at the upper pole of the kidney, a true renal-cell adenoma, and a carcinoma of the colon.

Aside from the teratomata and embryomata of the testis or ovary and mixed tumors of the parotid gland, combined tumors of the same organ have occasionally occurred, as for example epithelial and sarcomatous tumors occurring side by side in the breast and, in rare instances, the same combination in the uterus. Of the last type mentioned there has been one case of adenocarcinoma and fibrosarcoma of the

fundus and one of adenocarcinoma, epidermoid carcinoma, and fibrosarcoma, all primary in the fundus.

From the standpoint of embryology all three of the cases cited by Berry might be classed simply as sarcoma on the ground that the cortex of the adrenal and the tubules of the kidney are both of mesenchymal origin. Regarding the proper classification of adrenal-cell tumors alone there has been much discussion and uncertainty. As to whether the sarcoma in two of the author's cases was secondary to the epithelial type of growth and merely an excessive reaction on the part of the stroma, Berry states that in both of these cases there were two distinct tumors each of which was growing quite independently of the other.

A review of the literature on the subject of kidney neoplasms revealed two divergent opinions as to the origin of the hypernephroid variety. According to one group of investigators they arise from adrenal rests. Others are inclined to the view that they originate from regeneration of tissue. Combined tumors were rare.

The author found that it was not possible to determine the origin of these tumors exactly. Regarding two of them, he considered three possibilities:

1. A true mixed tumor with the two parts interlacing throughout, such, for example, as a mixed tumor of the parotid gland. This he definitely ruled out, however, for in both of these cases the different types of growth were quite distinct from one another and each part had its own stroma.

2. A true combination of two tumors—epithelial and connective tissue.

3. A sarcoma stimulated by the carcinoma and hence merely overactive stroma.

By the same reasoning that the neoplasms described did not fall into the first class mentioned, it seemed more probable that they were true combinations of two tumors rather than overactive stroma. This view was supported still further by the neoplasms in the third case. Inasmuch as the sarcoma here was of the smooth-muscle type, it was evident that it was merely overactive stroma. In this instance undoubtedly both of the tumors arose from foetal rests beneath the capsule of the kidney. In addition, the arrangement of the types of growth was the same in the three cases and therefore Berry was inclined to place the first two cases in the same class as the third and regard them all as true combined tumors.

G. E. BEILBY.

Young, E. L., Jr.: Silent Renal Calculi. *Boston M. & S. J.*, 1919, clxxxii, 573.

The frequency of so-called silent renal calculi, the damage done by them, and the length of time required for such damage are questions the author seeks to answer by a review of the recent literature and 3,960 autopsies done at the Massachusetts General Hospital since 1896.

Text-books teach that a stone is a potential or an actual cause of injury and therefore should be

removed, but a review of the literature favors the opinion that: (1) operation is not necessary when the stones are small; (2) stones in the calyces cause little damage unless their presence results in obstruction and infection; and (3) pelvic stones are much more harmful than cortical stones.

Thirty-seven cases of stone were found in the autopsy series, all those of patients who had entered the hospital for some other condition. Of these, 24 had had no symptoms. In 4 cases the urine was negative. In 13 there was a slight trace of albumin with a few pus cells, and in 6, much albumin and pus. The stones, which were bilateral in 7 cases and multiple in 20, varied in size from 1 mm. to large stones which almost filled the kidney. In 15 cases there was no gross damage. In 9 of these slight dilation of the pelvis or calyces or some slight atrophy of the renal elements was found. In 22, the kidney had been more or less damaged. In 5, chronic interstitial nephritis was present, but this had no relation to the stones. Microscopic examination revealed atrophy in several cases.

FRANK HINMAN.

BLADDER, URETHRA, AND PENIS

Buerger, L.: The Pathology and Operative Treatment of Contracture of the Neck of the Bladder. *J. Am. M. Ass.*, 1919, lxxiii, 1677.

The author restricts the term "contracture of the neck of the bladder" to designate pathologic processes involving the region of the internal vesical sphincter and the adjacent peri-urethral tissues of the prostatic urethra which do not belong to the class of true neoplastic formations and result in a greater or less coarctation, rigidity, or distortion of this portion of the urethrovesical canal. The author's conclusions are somewhat at variance with the observations of those whose investigations are based for the most part on material obtained at necropsy.

While admitting that the work of Randall and the anatomical studies of Lowsley are very valuable in demonstrating that there are other vesical obstructions than pure adenomata and so-called hypertrophies, his clinical and pathological observations seem to accord rather with the occasional clinical findings of other authors who report true stenosis of a fibrotic character at the internal urethrovesical outlet. Although other forms have been encountered, they all have this in common, i.e., an essentially fibrotic or inflammatory fibrotic lesion occupying the internal vesical sphincter and the peri-urethral intraprostatic region.

The author proposes a new operative procedure in the treatment of these cases based wholly on the nature of his pathologic findings which have demonstrated extensive involvement of the adjacent parts in the sphincteric lesions.

He divides his 17 cases pathologically into three classes: (1) fibrosis (8 cases); (2) fibrosis and inflammation (4 cases); and (3) fibrosis associated

with adenomata or fibromata, or infiltrating adenomata (5 cases).

Buerger maintains that lesions such as those in these 17 cases of contracture are too extensive and deep to be materially influenced by anything but a radical operation. During the last three or four years, therefore, his procedure has been as follows:

The internal sphincter is exposed suprapubically and the nature of the contracture studied visually and by the insertion of the index finger which finds in most cases the ring so sclerotic and tightly contracted that the finger tip cannot be made to enter it without tearing. Tearing is then done, the tear usually occurring at the anterior commissure. The inferior posterior lip of the sphincteric region is then grasped with forceps and drawn upward so as to give better exposure. The amount of tissue seized in the forceps depends upon the nature of the lesion, a smaller or larger bite being taken according to the apparent extent of the contracture. A sufficient amount of the sphincter having been seized with the forceps, it is removed in a large pyramidal piece by means of a long sharp knife. The base of the pyramid is formed by a portion of the bladder floor, its lateral walls by the lateral margin of the sphincter, and its apex by the fossula prostatica near the verumontanum. The incision is carried downward for at least $1\frac{1}{2}$ cm. or more through the sphincter into the prostate. Usually an intact piece may be removed. The sphincter is then dilated with the finger, and the urethra further dilated with a sound. Bleeding is controlled by a small pack placed in the sphincter region and posterior urethra and carried out through the suprapubic wound. If stitches are required to control the bleeding, care should be taken not to bring the cut mucosal edges together.

In the 17 cases operated upon in which the diagnosis was confirmed by pathologic examination there were 13 cures and 2 failures. One of the failures was a case of complete retention of urine and the other the case of a highly neurotic patient. Two other patients were merely improved although one of them is almost free from symptoms. FRANK HINMAN.

GENITAL ORGANS

Meaker, S. R.: A Modified Operation for Scrotal Varicocele, together with a Local Anæsthetic Technique. *Lancet*, 1919, cxcvii, 973.

The author's operation, which is based on anatomical principles, is very simple and can be very quickly performed under a local anæsthetic. It is more directly applicable to moderate sized varicoceles, however, than to the large ones. For the latter, the Parona operation is the method of choice.

Through the high varicocele incision the intercolumnar and cremasteric fasciæ are picked up and nicked, exposing the cremaster. Then four sutures are introduced from within the cremaster tube, picking the muscle up in three or four places. Four sutures are then placed anteriorly from without, also picking up the muscle. Care is taken to place the

sutures in the long axis of the tube and to avoid the genitocrural nerve. They are so introduced that, when tied, the top of the testicle is at the level of the root of the penis. The edges of the incision are approximated into the tube. The posterior sutures are tied first and then the anterior sutures. If necessary, an external suture is placed in the cremasteric incision. If it is desirable to remove any large veins they are resected individually, no effort being made to approximate the cut ends. This part of the operation is done before the sutures are introduced into the muscle.

When working with the patient under a local anæsthetic the author gives preliminary hypodermics of morphine and scopolamine, graduating the dose according to the patient's age and temperament and the magnitude of the operation.

The anæsthetic is given in two stages. First, the cord is held between the left thumb and forefinger at the exit from the external ring and one drop of a 2 per cent solution of novocaine is injected into the skin directly over the cord. Second, a fine needle is passed through the anæsthetized area, the needle being detached from the syringe in order to detect bleeding if a vein is struck, which, however, is a rare occurrence. Four cubic centimeters of 2 per cent solution are then injected into the cord. In five minutes a conductive anæsthesia of the scrotal contents results. In the meantime the skin is infiltrated. Following the operation the patient may be allowed to get up in about one week and is able to discard the suspensory in a fortnight.

The operation described gives adequate and permanent support to the testicle with few adhesions and no restriction of mobility. There is little or no thickening in the operative area and no postoperative congestion. J. E. STRUTHERS.

Moreau, L.: The Surgical Treatment of Gonorrhœal Epididymitis (*Traitement chirurgical des épididymites blennorrhagiques*). *J. d'uroł. méd. et chir.*, 1919, viii, 187.

In persistent gonorrhœal epididymitis, epididymotomy has demonstrated the presence of purulent collections in the inflamed tissues and the fact that their evacuation usually suffices to overcome the symptoms. It is well, however, to complete the epididymotomy by opening, inverting, and resecting the tunica vaginalis which will always be found to contain fluid.

The author gives the stages of his operative treatment as follows:

1. Local anæsthesia induced with stovaine.
2. A longitudinal incision in the globus minor which has the appearance of a more or less voluminous tumor; if necessary this incision is prolonged into the globus major.
3. Curettage of the globus minor.
4. Opening of the tunica vaginalis and destruction of the partitions which divide it.
5. Reflection and, if necessary, resection of the tunica vaginalis.

6. Replacement of the testicle and insertion of a drain which is led out through the lower end of the scrotal wound.

Drainage is discontinued after the second or third day. The patient is able to get up early and the operative results are excellent.

W. A. BRENNAN.

Hubbard, T. B.: Epididymotomy Treatment of Acute Gonorrhœal Epididymitis. *South. M. J.*, 1919, xii, 619.

The author summarizes his experience with epididymotomy in acute epididymitis in a series of twenty-five cases operated upon in an army base hospital.

Hubbard believes that the operation is imperative in acute cases with rapid swelling of the epididymis and severe pain and should be performed early. It is advisable also in recurrent and relapsing cases.

To prevent postoperative hydrocele the author resects the tunica vaginalis close to the epididymis and provides drainage. In the series reported there was no recurrence in the cases which could be followed, and the operation gave immediate relief.

H. L. SANFORD.

Michelson, H. E.: Syphilis of the Epididymis. *J. Am. M. Ass.*, 1919, lxxiii, 1431.

Syphilitic involvement of the epididymis or cord independent of disease of the testicle is rare. Three forms of syphilitic epididymitis have been described: (1) acute, diffuse, interstitial; (2) chronic, diffuse, interstitial, and (3) gummatous (circumscribed).

The diffuse type is the more acute and may occur after the second month of infection. Very few cases have been reported which occurred before the third year, and the majority of cases occur after the fifth year. Shadek states that in the early, diffuse variety of syphilitic epididymitis there is a partial or total swelling of the entire epididymis. This swelling at first feels uniform, elastic, and smooth, and does not attain a large diameter. As the process continues, however, distinct indurations develop which vary in size from that of a bean to that of a hazelnut. Pinner states that these are often found in the upper pole, more seldom in the body, and rarely, if ever, in the lower pole. The enlargement is rather acute, somewhat painful, and accompanied by hydrocele. After a few days the condition can be detected by palpation as a painless, irregular, elastic, rather hard thickening of the entire organ. After a few months the induration may become absorbed and the epididymis may return to its normal size, but more often it remains very solid and somewhat sensitive. In some cases it becomes atrophic, occluding the lumen. In the early type the process seldom passes on to the testicle, while in the gummatous stage the testicle is first attacked. The inflammation is rarely bilateral.

The chronic, diffuse, interstitial type is a connective-tissue change which may follow the more acute variety or come on independently. It is then a slow,

chronic, diffuse process, or a process consisting of a series of distinct cartilaginous indurations. The condition is painless. Examination reveals the entire epididymis as a firm, resistant, solid, uneven, indented tumor which is in apposition with the testicle but does not overlap it. The induration ends abruptly and does not taper into normal tissue. The vas deferens is rarely involved.

The gummatous type of syphilitic epididymitis begins in the late periods of the disease. Several small nodules, varying in size from that of a bean to that of a hazelnut, develop in the body or head of the epididymis. The masses are smooth, quite hard, and painless. They rarely break down to the extent that they rupture externally. The tumor has a connective-tissue origin, either from the external coats of a blood vessel or from connective-tissue membrane. It is made up largely of fibrous tissue and goes through the various phases which are characteristic of all gummata. Gummata of the epididymis may be secondary to gummatous involvement of the testicle.

The author gives the reports of 7 cases and draws the following conclusions:

1. Syphilitic involvement of the epididymis is not an extremely rare occurrence.
2. Bilateral involvement is unusual.
3. The more common type is the chronic, diffuse, interstitial type.
4. Some cases of hydrocele are due to syphilis.
5. All patients presenting themselves for disease of the scrotal contents should be examined for syphilis.
6. The diseased portion is not necessarily confined to the upper pole, the entire epididymis being frequently involved.

B. S. BARRINGER.

Lydston, G. F., and Latimer, M. J.: The Etiology of Hypertrophied Prostate. *Am. Med.*, 1919, n. s. xiv, 699.

The authors have carefully reviewed the history of the different causes of prostatic hypertrophy and sum up their conclusions in these words:

"Whether or not the bacillus coli primarily is responsible for a single case of prostatic hypertrophy, the fact remains that prostatic disease of whatever kind is a constant invitation to colon-bacillus infection, and few cases of primary prostatic enlargement run their course without its development. Irrespective of its etiologic importance, it is obvious that the effect of intercurrent colon-bacillus infection must be an increase of the enlargement and of the obstructive effect of the prostatic disease. As bearing upon the etiology of prostatic hypertrophy, in the authors' experience superadded colon-bacillus infection of the prostate and bladder is suggestively frequent in subacute and chronic deep-seated gonorrhœa. A very large proportion of cases of chronic so-called gonorrhœal cystitis and prostatitis really are colon-bacillus infections in which gonorrhœa merely has prepared the soil and plays a distinctly subordinate rôle."

W. E. LOWER.

LaRose, V. J.: Prostatectomy: A Study of Thirty-Four Cases from the Standpoint of Mortality and Morbidity. *J.-Lancet*, 1919, xxxix, 519.

In discussing the pre-operative treatment LaRose emphasizes the necessity for careful preparation and study of each case. Many of his patients came to him with severe traumata of the urethra requiring suprapubic drainage for long periods.

Of the various operative procedures the author prefers the two-stage suprapubic method with combined local and general anaesthesia. Only in comparatively young and vigorous patients does he perform a one-stage operation.

In the series of 34 cases, 3 deaths occurred soon after operation: 1 from cerebral embolus, 1 from uræmia, and 1 from bronchopneumonia. Six of the patients died from intercurrent diseases at varying periods after operation. Twenty-five are living and well from one to twelve years after operation.

H. L. SANFORD.

Pauchet, V.: Prostatectomy under Local Anaesthesia (Prostatectomie sous anesthésie locale). Paris: Maloine, 1919.

This work is based on 500 prostatectomies performed by the author. In the beginning the mortality varied from 10 to 15 per cent, but has since fallen to 2 or 3 per cent, and in the last 50 cases there were no deaths.

The author has performed 72 perineal prostatectomies, 2 by the suprapubic and perineal routes combined. He follows chiefly Freyer's technique.

When it is probable that infection has occurred the deferent canals are sectioned to prevent orchitis. To avoid the risk of hæmorrhage the prostatic cavity is tamponed. In cases of bladder infection, acute retention, distention of the bladder, incontinence, renal or cardiac insufficiency, diabetes, obesity, hernia, and poor general condition, the operation is performed in two stages. In such cases cystostomy with section of the deferent canals under local anaesthesia is not attended by risk.

The second stage of the operation is performed several weeks, or better, several months after the first stage, when the urine is clear and the patient appears to be in good general condition.

The author uses sacral anaesthesia induced by three injections of 5 cubic centimeters of Corbière novocaine-adrenalin on each side of the sacrum.

Emphasis is placed upon the importance of post-operative care. The tampon is withdrawn after four days and a suprapubic sound inserted. After eight days a retention urethral catheter is introduced. The bladder is closed under local anaesthesia fifteen days after the operation. Healing is usually complete in from twenty to twenty-five days.

Breathing exercises and general massage during the postoperative course are recommended to stimulate the general vitality, and disinfection of the teeth is advised to prevent digestive disturbances and pulmonary complications.

W. A. BRENNAN.

MISCELLANEOUS

Juaristi, V.: Traumata of the Urinary System as Occupational Accidents (Los traumatismos del aparato urinario como accidentes del trabajo). *Prog. de la clin.*, Madrid, 1919, vii, 198.

Neither the laws nor the physicians (of Spain?) take into consideration other lesions than those of the limbs, head, and eyes as accidents due to occupation. Among visceral lesions only hernia receive any attention, yet injuries of the urinary system are neither rare, insignificant, nor free from medicolegal problems. The patient's future depends on immediate care and this is usually not available. Moreover, in estimating how much the workman is incapacitated consideration is not taken of many contingencies which may make his future worse than might be expected from an apparently good present condition.

The kidney, in spite of its position and muscular protection, suffers contusions the effects of which are aggravated by the great vascularity of the organ. Usually these injuries are caused by falls, crushing accidents, or trampling by horses or cattle, as in the bull fights, though muscular strain such as that of ball playing may also produce them. Such cases are not reported oftener because renal tears are cicatrized so easily and promptly and because the renal lesion is usually associated with rupture of other viscera or fracture of the ribs or vertebræ which are more obvious. Even in postmortem examinations the kidneys may be overlooked unless a previous hæmaturia has called attention to them.

The lesions observed by the author have varied somewhat from the six experimental types of Tuffier: (1) simple capsular ecchymosis; (2) laceration of the pedicle; severe or even fatal hæmaturia; rupture of the ureter; (3) subcortical rupture; tearing of the parenchyma in a limited area, the intrarenal hæmatoma being walled in by the unbroken capsule walls; (4) longitudinal and transverse cortico-medullary ruptures of all degrees; complete or incomplete fissures; severing of a portion, usually one pole; (5) comminution comparable to an explosion, the numerous small fragments always being wedged-shaped; and (6) rupture into the peritoneum.

The symptomatic picture varies according to whether the renal lesions are simple or associated with other injuries. If pain and hæmorrhage are severe, shock is intense; otherwise it may be absent or come on late. The most constant local symptom is the defensive reaction of the lumbo-abdominal muscles. Colicky pain due to the passage of coagula or particles of parenchyma is seldom absent in the region of the kidney. Hæmorrhage is almost a pathognomonic symptom. It presents itself as hæmaturia if the passages are open to the meatus, or as a perinephric hæmatoma if the passages are obstructed, the capsule is broken, or there is a lesion of the vascular pedicle.

If the damage is not so great that the patient does not react and spontaneous hæmostasis is not

established promptly and if the ureter remains permeable, it is probable that cicatrization will take place after the immediate degeneration of the separated fragments. In such case part of the kidney becomes scar tissue and the remainder hypertrophies to compensate for the loss.

Surgical intervention is therefore not always necessary, but the indication is absolute under the following circumstances: intense or continuous hæmorrhage without noticeable diminution; frequent or permanent obstruction of the ureter or urethra by coagula or fragments; perirenal infiltration of urine; infection and tearing of the peritoneum.

The acute situation having been met, it remains to decide upon the permanent disability. In Juaristi's judgment, this is apt to be important, since such accidents have severe sequelæ such as sclerosis, nephritis, hydronephrosis, fistula, hernia, etc. Accordingly he believes such patients should be adjudged larger indemnities than are now considered sufficient upon a declaration of partial disability.

Injuries to the urethra occur from straddle falls and crushing accidents to the pelvis. Although there are exceptions, the anterior urethra is usually torn in the former type of accident and the posterior urethra by the latter.

The anterior urethra is always torn in front of the bulb and as a rule the rupture is subcutaneous. A history of an accident followed by urethrorrhagia interrupted only by clots establishes the diagnosis. Immediate removal to an operating room is necessary so that intervention may be had promptly to prevent infiltration of the urine and if possible to correct the urethra.

In any case, the essential problem is to secure the upper end of the urethra. It may be necessary to resort to a hypogastric incision and practice retrograde catheterization. Often plastic work must be done to re-establish the urethra, and there are cases in which repair is impossible, the only recourse being a hypogastric meatus.

Such a patient, after suffering for months, could not possibly be considered as having a full working capacity; there would be at least permanent partial disability, and more probably total disability. The author makes a strong protest against the injustice which deprives such persons of proper compensation.

M. M. MATTHIES.

Schmidt, L. E.: Bacteriuria. *Illinois M. J.*, 1919, xxxvi, 188.

If freshly voided urine free from pus is turbid, the turbidity being due entirely to the presence of micro-organisms and not to urinary salts, this condition is referred to as "bacteriuria."

There is a class of cases of bacteriuria, however, where pus also is found in the urine because of the presence of an inflammatory condition. In the vast majority of cases seen in routine practice the urine contains pus in varying amounts and this

pus may or may not have a bearing on the bacteriuria. Take for instance the so-called colon-bacillus infections of the kidneys. In these, pus and blood are found in the urine as well as large numbers of bacteria. In some other conditions also the bacteria may descend from the upper urinary tract but the pus may come from some chronic inflammatory condition of the urethra or adnexa.

Another class of cases are those in which the presence of pathologic conditions outside of the urinary tract has been definitely demonstrated and the bacteria, pus, and blood make their entrance into the urinary stream from these foci.

Finally, there is a distinct group of cases in which there is a complete absence of demonstrable lesions and pus, and the turbidity of the urine is due entirely to the presence of bacteria.

In the investigation of bacteriuria and the bacteriology of the urine, even when it contains pus, it is highly desirable to ascertain where the bacteria enter the urinary stream.

In the acute infectious diseases, such as typhoid fever, it is not at all uncommon to find the true bacteriuria due entirely to the bacillus typhosus, pus and blood being absent.

Again in chronic pulmonary tuberculosis, investigations have shown that in a fair percentage of cases the bacillus tuberculosis is eliminated through the kidneys constantly.

The same is true also in many other infectious diseases. At any time the bacteria may cause an inflammatory disease of the urinary tract which may be the only involvement or may be concomitant with the bacteriuria.

Often, for example, in the cases of patients who have had urethral infections with adnexal complications which have run their course, bacteria may be found in the urine constantly in the absence of all clinical evidence of further inflammatory disease focal conditions, pus in the urine or adnexa, blood changes, fever, or general symptoms. Undoubtedly the point at which the bacteria enter the urine has often been found. Occasionally bacteriuria has been noticed following instrumental treatment or examination and therefore it has been concluded that the point of entrance was an injury.

In this connection the question again comes up as to why bacteria are pathogenic at certain times and non-pathogenic at other times, and why they sometimes cause marked inflammatory reaction and at others are apparently not at all injurious to the same tissue. The colon bacillus in some instances, for example, causes most violent attacks of true infection of the kidneys, high temperature, chills, and most pronounced general and local signs and symptoms. In these cases the point of entrance is thought to be exactly the same as in cases of colon-bacillus bacteriuria. Many theories have been set up and it is true that many factors may be involved, but in the author's opinion the explanation is to be sought in the virulence of the particular strain and the general and local resistance of the body.

Bacteriuria is supposed to occur under conditions similar to inflammatory diseases. When an inflammatory condition subsides, however, certain changes in the tissues result and the invading micro-organisms disappear, while in bacteriuria this is not true. In these cases microscopic examination does not reveal any changes in the tissues and in some instances the bacteria appear and reappear, though as a rule their presence is constant.

The symptoms in cases of bacteriuria as observed by Schmidt are varied. In some instances, both local and general symptoms are practically absent or only temporarily absent while in others there may be only general symptoms such as headache, backache, a feeling of extreme tiredness, and in some cases a rise in temperature and chills. In still other cases there are only local urinary symptoms. Finally there are cases with both general and local symptoms of varying severity.

During the course of any one of these four distinct types of bacteriuria there may be chills and fever or only a single chill followed by fever, and one or all of the general and local symptoms may become very pronounced. To illustrate the various phases of the condition the author reports the following cases:

GROUP 1. Female, aged 47 years unmarried. Seen November, 1900. The patient had had no sickness of any kind except typhoid fever at the age of 31 years. The examination was negative in every respect except for cloudiness of the urine which the patient claimed had persisted since the attack of typhoid fever. She did not recall any local or general symptoms except chronic tiredness. Ureteral catheterization showed turbid urine from both sides, and cultures showed the presence of the bacillus typhosus. Lavage of the renal pelvis and general treatment gave no relief.

GROUP 2. Male aged 55 years. Considered himself in perfect health until April, 1916, when he had headache, became drowsy and dizzy, and thirty days after the onset had a chill and an increase in temperature. There were no urinary or sexual symptoms. The urine was turbid, with the typical appearance of bacteriuria, and contained a few shreds which showed the presence of pus. There were no other abnormal findings except bacteria in the urine. At the next visit a catheter was introduced into the bladder under sterile precautions, and the urine withdrawn was slightly cloudy. The vesicles were palpated and Felehis' instrument was used to strip them. In all instances cultures showed the presence of the colon bacillus. In the secretions from the vesicles pus and a few red blood corpuscles were demonstrated. The patient was given systemic and local treatment, including vaccine treatment. In June, 1918 his condition was practically the same as at the onset.

GROUP 3. Female, married, aged 28 years. The chief complaint was a feeling of fullness and a burning sensation over the lumbar region. There were practically no urinary symptoms. As a rule the

patient felt tired and sleepy. The usual medical and vaccine treatment has given no relief. The urine has the typical appearance of a bacteriuria and separately collected specimens from the right side have always given pure cultures of colon bacilli.

GROUP 3. Female, married, aged 59 years. Complaint was made of discomfort after urination resembling a tenesmus which persisted for ten or fifteen minutes; urination necessary every two and a half hours, day and night. The examination was completely negative. Ureteral catheterization at three different times, four weeks apart, yielded perfectly clear urine, but colon bacilli were obtained every time from both kidneys. No pus was present in either the bladder or kidney urine.

THEODORE DROZDOWITZ.

Young, H. H., White, E. C., and Swartz, E. O.: A New Germicide for Use in the Genito-Urinary Tract: "Mercurochrome-220": Preliminary Report of Experimental and Clinical Studies. *J. Am. M. Ass.*, 1919, lxxiii, 1483.

During the past two years the authors' research work has been given over largely to the study of antiseptics with a view to developing drugs applicable to the genito-urinary tract. As a result of both experiments and clinical use, Davis and Harrell recommended the use of acriflavine in the treatment of acute gonorrhoea.

Impressed with the possibilities of dyes as a basis for the development of therapeutic compounds, the authors have concentrated their efforts on the production of new drugs possessing the penetrating qualities of dyes which at the same time are germicidal, relatively non-toxic, and non-irritating. The number of compounds that have been and are being produced in the pursuit of this research is considerable. From among them the substance reported upon in this paper was selected for extended study.

In mercurochrome-220 we have a drug of demonstrated germicidal value. The speed with which some old infections of the bladder and kidney pelvis have disappeared after its use is striking, and the absence of irritating and toxic qualities, together with the ability of the patient to retain a 1 per cent solution for hours without discomfort, are sufficiently proved to establish the possibilities of the drug in these conditions. For the first time we have a drug of great germicidal strength that can be tolerated in the human bladder for several hours, an ideal condition from the standpoint of its sterilizing effects.

In synthesizing a drug for local use as a urinary antiseptic it was sought to combine the following properties: (1) ready penetration of the infected tissues; (2) lack of irritation of the drug to tissues; (3) high germicidal activity; (4) ready solubility in water and stability of the solution; (5) freedom from precipitation in urine; and (6) sufficiently low toxicity to avoid systemic effects from the small amount of the drug that may be absorbed. Mercury was chosen as the active germicidal principle to be substituted in the dye molecule. The organic combina-

tions of mercury generally exhibit lower toxicity than corresponding amounts of mercury in salt form, and frequently, but not always, their germicidal action is milder than that shown by the salts.

To the substance obtained by substituting one atom of mercury in the molecule of dibromofluorescein the authors have given the name "mercurochrome-220." Chemically it is dibrom-oxymercury-fluorescein or its sodium salt. The latter contains about 26 per cent of mercury.

The free acid is a red powder insoluble in water but readily soluble in sodium hydroxide solution, with the formation of a cherry-red color and showing fluorescence on dilution. The dry salt forms iridescent green scales which are slightly hygroscopic and readily soluble in water. The solution is stable and not affected by moderate heat or exposure to the air. Strongly acid urine gives a slight precipitate of the free dye. There is entire freedom from precipitation when a 1 per cent solution of the drug is mixed with an equal volume of a medium rich in protein, such as hydrocele fluid. The solution stains the skin a bright red color, but the stain is readily removed by rubbing first with 2 per cent potassium permanganate solution and then with 2 per cent oxalic acid solution.

Attention must be paid to the penetrating power of any germicide for use in the urinary tract. Fenger has shown that "in thirty-eight hours after inoculation the gonococci have penetrated deep into the layers of the mucous membrane which has become acutely congested, the epithelium undergoing mucous degeneration, and exfoliating in patches."

During the administration of mercurochrome-220 to determine its toxicity by injecting solutions of it into a rabbit's ear-vein the compound spread rapidly from the vein into which it was being injected and in a few seconds the entire ear was colored a reddish pink. This color persisted with varying intensity for from twenty-four to forty-eight hours.

With a view to determining the penetrability of this mercury-bearing dye when used in the urinary tract a series of direct experiments was carried out. A rabbit was catheterized with a soft rubber catheter. Through this catheter an ounce of a 1 per cent solution of the drug was slowly injected into the bladder and the catheter slowly withdrawn, allowing some of the fluid to escape through the urethra. At the end of five minutes the catheter was again introduced and the bladder was emptied. The rabbit was quickly killed and the bladder and urethra were dissected out intact. The bladder was then opened and the excess of the solution was removed by washing with water. Frozen sections of the urethra and bladder were made immediately and examined. In other instances the bladder and urethra were opened and immediately transferred to formaldehyde solution and hardened. Paraffin blocks were made and sections cut.

This experiment was carried out several times, the catheter being used in one case, and in other instances the bladder being filled through the ure-

thra by means of a small syringe. The latter method was used to avoid any possible trauma to the urethral mucosa. In other rabbits the abdomen was opened under ether anesthesia, the ureters were exposed, the ureter and kidney pelvis were gently filled with a 1 per cent dye solution by means of a small record syringe and the ureter was ligated. Care was taken to prevent overdilatation of the kidney pelvis. After five minutes the rabbit was killed, the ligature removed from the ureter, the kidney and the ureter were taken out intact, and frozen sections were made and promptly examined. In other instances paraffin sections were made.

Examination of the frozen sections as well as of the paraffin sections showed that the epithelial cells of the urethra were stained a deep red. This staining was most intense in the superficial layers and became less intense toward the submucosa. In places the submucosa was stained, though not so uniformly as the epithelial layers. In some areas the stain penetrated the submucosa into the muscularis. The mercury-bearing dye stained the epithelium of the anterior and posterior urethra uniformly, and to a less extent penetrated to the submucous layers. Sections of the bladder and the ureter showed the same uniform penetration and staining of the cytoplasm of the epithelial cells. The submucosa was less deeply stained. Sections of the kidney pelvis showed penetration and staining of the epithelium. The dye had been taken up also by the cells of the collecting tubules which were stained for a short distance up the tubules from the papillae. In the urethra the epithelium of the glands opening into the urethra was stained for some distance from the mouths of the ducts.

In determining the toxicity of the drug various solutions were administered intravenously. A variation in the amount of the drug that rabbits and dogs could tolerate was noted. Ten milligrams per kilogram invariably killed rabbits in twenty-four hours, but no gross lesions were found at necropsy. Rabbits receiving 5 mg. per kilogram showed a decrease in phenolsulphonephthalein output and an albuminuria that lasted about a week. Dogs tolerated 10 mg. per kilogram very well with no evidence of discomfort or illness. In each instance an albuminuria without casts and a temporary reduction in phenolsulphonephthalein output but no rise in blood urea resulted. The albuminuria persisted about five days. At no time were casts found. The phenolsulphonephthalein output returned to normal with the disappearance of the albuminuria. No evidence of kidney damage was found at necropsy in animals killed at the end of the experiments.

One per cent solutions of mercurochrome-220 gave no evidence of irritating qualities when used in the conjunctival sac of rabbits. Solutions of this drug in strengths varying from 0.1 to 5 per cent have been used in the human genito-urinary tract as a local antiseptic. In the kidney pelvis a 1 per cent solution was used. This was slowly injected through the ureteral catheter, the catheter plugged, and the

solution retained for five minutes. No sign of irritation or reaction followed its use. In the urethra a 5 per cent solution caused only temporary burning when retained five minutes, and a number of cases of acute urethritis have been treated by the use of a 1 per cent solution injected four times a day, the solution being retained five minutes at each injection. There was no irritation beyond occasional temporary smarting. No cases of retention have been seen, and no stricture formation has resulted.

In only two instances was there any complaint of burning or irritation. These were both cases of chronic cystitis in old men with residual urine.

The outstanding fact observed on comparing the germicidal values of mercurochrome-220, acriflavine, protargol, and argyrol is the rapidity of action of the mercury compound in fairly high dilutions. In one minute it killed *bacillus coli* and *staphylococcus aureus* in a dilution of about 1:1,000, a result obtained with none of the other drugs even in one hour. Its effect in fifteen minutes is nearly as great as in twenty-four hours as in this short time in dilutions of 1:5,000 it killed *bacillus coli* and in dilutions of 1:10,000 killed *staphylococcus aureus*. A few tests were made to learn the minimal time in which a 1:100 solution would sterilize. *Staphylococcus aureus* was killed almost instantaneously. The same test on *bacillus coli* showed that a few organisms remained after ten seconds' exposure to the drug. Since a 1:800 solution kills this organism in one minute, the time necessary for a 1:100 solution to kill it is possibly no more than thirty seconds.

Acriflavine was shown to be much less potent as a germicide in even the most concentrated solutions if allowed to act on the organisms for one hour or less. It surpassed mercurochrome-220 in the twenty-four hour test, however, as at this time-period it appeared to be about four times as effective as the mercury compound. When rapid disinfection is a desideratum, as it appears to be, mercurochrome-220 is superior to acriflavine.

Comparison of mercurochrome-220 with the silver protein compounds is open to two interpretations. If we consider the action in the test tube of those solutions used clinically—10 per cent argyrol and 1 per cent protargol—the silver compounds compare favorably with the mercury dye except in the action of protargol on *staphylococcus aureus*. If, on the other hand, we consider the action of solutions of the same concentration of the three substances, we find that the silver compounds are in no wise comparable with mercurochrome-220. Thus, whereas both argyrol and protargol in solutions of 1:1,000 fail to kill either *bacillus coli* or *staphylococcus aureus* in one hour, the same concentration of the mercury dye kills both organisms in about one minute.

In the treatment of infections of the kidney pelvis, the following procedure was employed:

Ureteral catheterization was done and a collection obtained from each kidney. This was centrifugalized and a stained smear made and examined micro-

scopically. After the collection was completed, the kidney pelvis was gently filled, the gravity method being used in some instances and the syringe in others, with a 1 per cent solution of mercurochrome-220, the catheter plugged, and the fluid retained in the pelvis for five minutes. There was no complaint of pain and no severe reaction. When the urine from each kidney was free from pus and organisms for a week the patient was discharged to return for further observation in a month.

In the treatment of bladder conditions, the urethra was first irrigated with sterile water, a coude catheter was passed, and the bladder washed clean. One ounce of 1 per cent mercurochrome-220 was then injected through the catheter by pressure from a bulb syringe or a Keyes syringe. The patient was instructed to retain this solution for at least one hour, and longer if possible. This procedure was carried out twice a day, and in some instances three times a day. Occasionally there was some slight burning and smarting, but this lasted only a short time. After three or four treatments, the urine usually began to clear up, and as soon as it was free from organisms the number of treatments per day was gradually reduced. It was noticed that as long as mercurochrome-220 was used in the bladder the urine remained hazy owing to the presence of exfoliated epithelial cells.

An abstract of ten cases treated is reported.

Fifty-one cases of acute specific urethritis were treated by intra-urethral injections of 1 per cent solutions of the drug described. These were all public dispensary cases. In none was there any irritation beyond a temporary burning or smarting, whether the drug was used in the anterior or the posterior urethra. The method used in these cases was as follows:

A microscopic examination was made to determine the presence or absence of gonococci, the three-glass test was used to determine the part of the urethra involved and the extent of the involvement, and the prostate and vesicles were examined at the first visit. An anterior urethral irrigation of warm sterile water or dilute (1:10,000) potassium permanganate solution was then given. This was followed by the careful injection into the anterior urethra of sufficient 1 per cent mercurochrome-220 solution to fill the anterior urethra completely, the patient compressing the lips of the meatus and retaining the solution for five minutes. If the posterior urethra was involved the solution was gently forced into the posterior urethra by means of a bulb syringe and retained in the bladder for an hour or more. A small quantity of the drug solution and a blunt-nosed urethral syringe were then given to the patient and he was instructed to inject the solution four times a day immediately after urinating and retain it for five minutes. When he returned to the clinic, smears were examined microscopically, and as the organisms lessened in number, the number of injections was reduced to three and then to two and later to one per day. The reduction should be gradual. As

long as the drug is used the urine will remain cloudy owing to exfoliated epithelial cells. These will be found stained pink, while the polymorphonuclear cells are not stained by the drug.

Thirty patients were followed until an apparent cure was effected. Twenty-one others were improved and discontinued treatment. The average length of time required to render the discharge free from gonococci was ten days. The shortest time was three days. These were acute cases, two of which remained free from further infection. In one case there was a recurrence of the organisms after nineteen days due to a re-infection from the prostate. The longest time required to render any case gonococcus-free was seventeen days. This was a case of an acute exacerbation of a chronic infection with involvement of the posterior urethra and the prostate.

Recurrence of organisms took place in six cases (20 per cent of the total). Two of these six were cases in which the anterior urethra alone was involved, and the recurrence was probably due to stopping the injections before the entire canal had been sterilized. Four of the recurrences occurred in cases with both anterior and posterior involvement. Epididymitis developed in two of these cases, and in one case strictures were found subsequently in the bulbous urethra.

The anterior urethra alone was involved in eighteen cases (60 per cent of the series). There was anterior and posterior involvement in twelve cases (40 per cent) at the time the patients first presented themselves for treatment. Chronic prostatitis was found to be present in fifteen cases (50 per cent) on first examination. Three cases (10 per cent) developed complications after treatment was begun. In two cases in which the involvement was anterior when first seen, posterior urethritis and

epididymitis developed, and in one, acute prostatitis and seminal vesiculitis were later complications.

Following the first injections there is a slight increase in the amount of the discharge, which rapidly becomes mucopurulent and then serous as it diminishes in amount. With this change in the discharge the microscopic character of the discharge also changes. At first the polymorphonuclears predominate, but later the epithelial cells increase in number as the polymorphonuclears diminish. As the epithelial cells increase in number and the organisms disappear, the number of daily injections should be reduced gradually, the discontinuance of the drug taking about a week. Any remaining catarrhal process in the urethra should be treated by the use of dilute potassium permanganate solution (1:10,000) as a daily irrigation or a 1:10,000 solution of silver nitrate. When the posterior urethra is involved, it frequently clears up before the anterior urethra, in some instances only three or four injections being necessary to render the urine in the third glass clear.

In the cases treated by the authors chancroids were thoroughly cleaned with soap and water and all the necrotic tissue was removed. A moist dressing of 1 per cent mercurochrome-220 was then applied and some of the solution given the patient with instructions to moisten the dressings twice a day with it. Later it was found more convenient to use a starch paste containing 5 per cent mercurochrome-220 by weight, instead of the solution, dressing the sore only once a day. No complaint of irritation or burning was made by any of the patients. In all of the cases the sores became clean in from one to four days and presented a healthy healing surface. The prompt change in the appearance of the lesions was very striking.

B. S. BARRINGER.

SURGERY OF THE EYE AND EAR

EYE

Charles, J. W.: Positive Focal Tuberculin Reaction in a Spindle-Cell Sarcoma which had Perforated the Sclera. *Arch. Ophthalm.*, 1919, xlviii, 568.

Charles records the physical findings, clinical history, and pathological report of a case of spindle-cell sarcoma of the eye which was of such slow growth that he at first believed it to be a tuberculoma. The positive tuberculin reaction he attributes to the origin of the tumor in the uveal tract, stating that evidently this patient had a uveal tuberculosis which merely extended to the tumor. T. D. ALLEN.

Nance, W. O.: Serpiginous Ulcer of the Cornea and Its Treatment. *Illinois M. J.*, 1919, xxxvi, 182.

Serpiginous ulcers of the cornea are very apt to be overlooked. One of the principal methods of treating them is thermotherapy or "chouffrage," which was advocated several years ago primarily by Weekers of Liège and later by Prince under the term "pasteurization." According to this method the cautery is brought close to the cornea but does not touch it. Shahan of St. Louis found in animal experiments that a temperature of 152 degrees F. for one minute was sufficient to stop the ulcerative process both bacteriologically and clinically. T. D. ALLEN.

Wilder, W. H.: The Treatment of Symblepharon and the Restoration of the Orbital Socket. *Am. J. Ophthalm.*, 1919, ii, 807.

The operation for symblepharon requires varying degrees of technical skill in proportion to the degree of the attachment. The author deals only with cases in which the eyelid is adherent to the eyeball.

The degrees of adhesion are spoken of as "anterior symblepharon," "posterior symblepharon," and "total symblepharon." A severe form is that in which the edges of the eyelids have been destroyed so that the eyelids have grown together, resulting in what is known as "ankylosymblepharon."

The causes leading to these conditions are for the most part burns and eschars from acids, alkalis, molten metal, lime, and gas flames, and ulceration from certain diseases such as pemphigus, diphtheria, and a long-standing trachoma wherein the cul-de-sacs have been obliterated by the destruction of the tissues so that a condition as bad as that due to a burn results.

Mention is made of the work of the older surgeons among whom were Arlt and Knapp. Fuchs is quoted as follows: "Cases of extensive symblepharon posterius, and obviously all cases of symblepharon totale, are incurable. The same is true of symblepharon induced by the gradual shrinking of the conjunctiva."

According to Wilder, the problem, is practically the same in all the degrees of the condition, but varies somewhat according to the type in hand. When the eyeball is present the problem is to allow mobility and prevent the irritation of the eye by the dragging of the adhesions. If the eyeball is absent, the cul-de-sacs must be restored for the comfortable wearing of a prosthesis.

In any given case of burn in which the conjunctiva has been destroyed in whole or in part, the eschar must be cast off before healing can begin. Granulation tissue develops to replace the lost epithelium, and from this fibrous filling-in of tissue we get the contractions that appear later. It is at this point that the ophthalmic surgeon should come to the aid of nature. The difficulty in this work is to keep the grafts of tissue in place, whether they are epidermis or mucous membrane. There is also the danger of injury to the integrity of the cornea which must be taken into consideration.

Wilder has surmounted these difficulties by the use of specially prepared plates of block tin. Upon these tin shapes, fashioned to suit the individual case, he spreads his grafts and anchors them in the newly formed cul-de-sac. Morton and May have used successfully glass plate and porcelain shell with a curvature similar to that of the eyeball. Hotz early employed a thin lead plate, and Woodruff used a sheet of block tin cut to the required size and molded to the proper curvature. Whatever the support, however, it is very necessary that the plate should have a circular opening the size of the cornea and should be coated with paraffin with a melting point of 130 degrees or higher.

The thickness of the block tin used by the author is 1 mm. This is easily sterilized and fashioned with a knife or the scissors to the required shape so that it fits the cul-de-sacs well above and below. The paraffin coating must be smooth. To make this coating it is advised to hold the plate at the edge with a small forceps and dip it repeatedly into melted paraffin that is kept to the desired point of heat by placing the vessel containing it into a basin of hot water. The paraffin is cooled by dipping the plate into cool water. Paraffin is added by repeated immersions until the desired thickness is obtained.

Such a plate may be employed following a burn of the conjunctiva. This, however, is not sufficient, for as soon as the eschar is cast off the granulations appear and the surfaces will adhere with subsequent contraction. At this point, therefore, Wilder advises the use of grafts maintained in position with the paraffined tin plate. Mucous grafts are preferable, and if the area to be covered is not too great they can be obtained from the inside of the lips or, in

women, from the inner surface of the labia or vagina. Thiersch grafts may also be used. They should be cut thinly from the inner surface of the arm with a flat-back razor such as is employed for section cutting. The graft should be cut larger than necessary and transferred immediately from the razor to the paraffin plate with the raw surface outward. It will adhere well and can be smoothed out without wrinkles. During all this manipulation the graft must be kept warm with salt solution that is dropped upon it by an assistant.

The author advises early operation to cover the raw surfaces and thus avoid serious symblepharon that later would require extensive operation.

In the preparation of the cul-de-sac the surgeon should keep close to the tarsus so as to have a lid that will not be too thick when healing has taken place. It is well to make the sac too deep rather than too shallow. The graft should be made larger than the area to be covered as it will take care of itself or can be trimmed off later at the subsequent dressings.

Reference is made to the work of Uthoff who, during the late war, had experience in 600 eye cases, 11 per cent of which were wounds of the orbit. In these the problem was to restore the orbital socket for the receipt of a prosthesis. In numerous cases Uthoff was able to make the wearing of a prosthesis possible by plastic operations on the lids and conjunctiva.

In approaching the problem of preventing subsequent contraction in the tissues, the author emphasizes the importance first of making the dissection deep enough. To that end it is carried down to the margin of the orbit so that the periosteum may be seen. Secondly, all scar tissue must be dissected away. The external canthus may be divided so as to give more room for the insertion of the plate and its accompanying graft. Occasionally it is well to use more of the corium of the skin, thus making a heavier graft, and in such cases it is wise to insert sutures with two needles passed through the graft at the bottom of the cul-de-sac. These sutures should be passed through the periosteum and then out through the cheek, where they should be tied upon a small roll of gauze. The latter point gives value to the operation of Weeks who restores the cul-de-sac with Wolff grafts which are anchored to the periosteum in this manner.

The paraffin plate is usually sufficient to hold the graft without sutures. The canthus when cut must be restored at the close of the operation with sutures. The plate is removed after several days, at which time the grafts will be adherent. Irrigation may be practiced during the time the plate is in the socket and the hole in the plate permits more ready washing. The plate should be worn for several weeks. It may be necessary to trim it down from time to time, and in some instances it may be cut in half to permit its more free insertion. When this is done a sort of hinge may be made by stitching it together in the center. A special artificial eye should be

made for such cases to conform to the new cul-de-sac and thus prevent irritation and the possible development of scar tissue.

J. S. CLARK.

Lane, F.: Persistent Posterior Fibrovascular Sheath of the Lens. A Report of Two Clinical Cases and Three Eyeballs Examined Microscopically.
Arch. Ophthalm., 1919, xlviii, 572.

In this paper, which is illustrated with colored drawings, Lane points out the clinical characteristics of the posterior fibrovascular lens sheath, the pathology of three eyes removed for suspected glioma, and the points in the differential diagnosis. He draws the following conclusions:

1. As the condition in the two clinical cases was congenital, it is certain that if an examination had been made during infancy or early childhood, the possibility of glioma would have been considered.

2. In eyes presenting evident congenital anomalies, an opaque, vascular tissue behind the lens completely or incompletely surrounding the posterior capsule should strongly suggest the possibility of a persistent posterior fibrovascular sheath of the lens.

3. Pigment, particularly in the posterior portion of the lens and a postlental vascular membrane suggest a congenital defect of the posterior capsule and hæmorrhage in the lens.

T. D. ALLEN.

Middleton, A. B.: Macular Hole in the Retina.
Am. J. Ophthalm., 1919, ii, 779.

In his position as oculist on a special examining board it was Middleton's fortune to examine 23 cases of macular hole in the retina. In the series referred to there were 19 cases of round and 4 cases of elliptical retinal holes. The elliptical holes are large, the long axis being as a rule horizontal. The small holes observed were round. The color of the choroid as seen at the bottom of the holes with the ophthalmoscope varies between a light and a dark mottled cherry red.

It is assumed that the cause of most of these conditions is accidental injury. Small, white, exudative specks observed in most of the cases were thought to be remnants of a hæmorrhage which occurred at the time of injury.

A central scotoma was present in each uncomplicated case, its amount bearing some relation to the size of the hole as the largest retinal hole showed the largest scotoma. Four of the cases were complicated by a rupture of the choroid which occurred on the temporal side of the macular hole. The nasal half of the field of vision in each case was dark. In 14 of the cases the right eye had been injured, and in 9, the left eye.

In the cases reported, 13 of the macular retinal holes were found in colored soldiers and 10 in white soldiers. This variance is believed to be due to the almost universal carelessness of colored people, their indulgence in fist fighting, and general roughness.

It is a remarkable fact that an injury sufficiently severe to cause retinal hole in the macular region very seldom if ever results in fluidity of the vitreous,

dislocation of the lens, traumatic cataract, detachment of the retina, or optic atrophy.

A detailed summary of the findings in the 23 cases is given and the article is illustrated with 9 drawings by the author (3 of them in color) to show the various conditions mentioned. J. S. CLARK.

EAR

Good, R. H.: Extradural Irritation and Abscess. *Illinois M. J.*, 1919, xxxvi, 226.

In discussing extradural irritation and abscess Good makes a plea for early exposure in order to prevent such serious and often fatal complications as brain abscess, meningitis, and sinus thrombosis.

The symptoms depend upon: (1) the amount of pain the patient is able to endure from the mechanical irritation of the sensitive dura; (2) the severity of the infection and the extent of the edema of the dura; and (3) the degree of intracranial pressure. The symptoms of mechanical non-infective irritations of the acute and chronic infective types are described in detail. O. M. ROTT.

Lille, H. I., and Barlow, R. A.: Operation for Acute and Subacute Mastoiditis: Results in a Series of Sixty-Five Cases. *J.-Lancet*, 1919, xxxix, 573.

In a series of 65 patients treated by what the authors call a complete mastoidectomy, in which all the mastoid cells were exenterated, the average post-operative convalescence lasted thirty-one days. The shortest, fifteen days, occurred in 4 cases, and the longest, one hundred and twenty-eight days in the case of an old person.

The series included 6 patients with sinus thrombosis and 2 with jugular ligation. Two patients had meningitis at the time of operation, 1 a perisinus abscess, and 1 a pre-operative facial paralysis.

There were 4 deaths, 2 from meningitis and 2 from erysipelas in old men, which developed three and six weeks after operation.

In all but 3 cases the hearing after operation was normal as compared with that of the other ear. The hearing is not affected unless the involvement of the middle ear has been unusually extensive.

The conclusions drawn are as follows:

1. In cases of definite mastoiditis operation is indicated reasonably early. The mortality is practically nil.

2. Preservation of hearing is fairly certain.

3. A second operation should not be necessary except for complications such as sinus thrombosis or brain abscess.

Neuhof, H., and Cocks, G. H.: Remarks upon the Treatment of Gunshot Wounds of the Mastoid. *Laryngoscope*, 1919, xxix, 615.

The method of treating gunshot wounds of the mastoid depends upon whether the patient is operated upon early, before the onset of wound contamination or definite infection, or whether he is seen first after the wound is suppurating.

Operation before wound infection embraces: (1) excision of the wound; (2) removal of in-driven bone fragments and foreign bodies and damaged portions of the mastoid; (3) closure of the dural tear by suture or by fascial transplant; and (4) primary closure of the wound.

The complication of laceration of the lateral sinus is treated by postage-stamp graft or ligation of the sinus, depending upon its extent. Larger lacerations of the sinus are treated by double ligation.

Treatment after wound infection includes: (1) X-ray examination to discover the presence of additional foreign bodies; (2) excision and drainage of the bone wound, with complete exenteration of the mastoid cells; and (3) the use of the Carrel-Dakin technique. O. M. ROTT.

Clark, J. S.: Immediate Closure in Selected Cases of Acute Mastoiditis. *Illinois M. J.*, 1919, xxxvi, 249.

Clark advises immediate closure of the mastoid wound in mild cases of acute mastoiditis. This advice is based on one successful case in which drainage was procured through the external auditory canal by lowering the facial ridge and making a plastic flap as is done in the radical operation. The patient left the hospital on the sixth day and was back at work in two and one-half weeks. O. M. ROTT.

SURGERY OF THE NOSE, THROAT, AND MOUTH

NOSE

Lubman, M.: *The Submucous Resection Operation; with Report of a Case.* *N. York M. J.*, 1919, cx, 847.

Lubman presents a very interesting and timely paper on the causes of failure following the submucous resection of the nasal septum. The following conclusions are offered:

1. Not all deflected septi require operation.
2. A thorough study of the intranasal structures is absolutely necessary before the patient is subjected to operation.
3. When a deflected septum is associated with ethmoiditis an operation upon the septum alone will not effect a cure. A much better result will be obtained by operating upon the ethmoid and leaving the septum untouched.
4. In atrophic conditions of the nose, operations should be avoided as far as possible.
5. The patient who comes to be relieved of his sufferings and is willing to undergo an operation is justly entitled to an honest and thorough examination and an operation based upon scientific data.

O. M. ROTT.

THROAT

Tongs, M. S.: *Hæmolytic Streptococci in the Nose and Throat, with Special Reference to Their Occurrence after Tonsillectomy.* *J. Am. M. Ass.*, 1919, lxxiii, 1050.

Tongs has reviewed the most recent literature regarding the morphology and cultural characteristics of hæmolytic streptococci in the throat of the healthy and the sick, and presents the results he obtained from cultures of the nose and throat following tonsillectomy. His conclusions are that the tonsils, especially when hyperplastic, are a breeding place for hæmolytic streptococci, and that complete tonsillectomy is in most cases followed by the absence of hæmolytic streptococci from the throat.

O. M. ROTT.

Symonds, C. J.: *Removal of Tonsils and Adenoids.* *British M. J.*, 1919, ii, 558.

Symonds states that, as he has demonstrated for many years, the MacKenzie guillotine is efficient in cleanly removing the tonsils and adenoids. He emphasizes the point that the guillotine ring must be placed behind and below the tonsil. Standing on the right side of the patient whose head is inclined slightly backward, he removes the left tonsil first. The handle of the guillotine is brought across to the right side, the fingers of the left hand pressing the tonsil inward while the thumb presses

the blade outward. The blood having been swabbed away, the right tonsil is removed. Bowen uses the guillotine with the blade reversed.

The question of the advisability of complete extirpation is brought up, as is also the amount of relief which can be expected from partial removal and the proportion of recurrences of tonsillitis.

For the past ten years the author has been obtaining uniformly good results and in this period he was obliged to re-operate upon only one patient. As he does not believe that the recurrences in children amount to 1 per cent he is of the opinion that the general adoption of complete dissection of the tonsils is not justified.

In most cases in which the guillotine is used the deep portions of the tonsils remain but this does no harm and the remnant may be removed with a curette.

Symonds differs from Bowen in that as an anæsthetic he advocates ether given with Clooer's apparatus rather than ether chloride which, in his opinion, is not as safe.

H. R. LYONS.

Lynah, H. L.: *Laryngeal Bouginage.* *N. York M. J.*, 1919, cx, 838.

The author treats cases of laryngeal stenosis following the long-continued wearing of a tracheal cannula by means of laryngeal bouginage instead of laryngotomy. The use of the bougie and rubber laryngeal tubes is explained and case reports are added.

Bouginage in these cases requires great care lest undue force be employed in dilating the stenosed larynx and trachea. A small olive-tipped bougie should be passed from above through the endoscope, care being taken to avoid a false passage into the tissues of the neck, or an injury of the œsophagus. The first size or smallest bougie should be placed against the stricture with the olive directed ventrally. If the small bougie does not pass readily, forcible dilatation should not be attempted. After five minutes the trial should be discontinued, a second attempt being made a day or so later. Usually after the third or fourth trial the small olive will pass through the tightest stricture. Forcible attempts should never be made with a large bougie until the smaller size has been passed with ease several times. When this has been done continuously larger bougies may be used, but never more than three sizes at any single sitting.

After endoscopic bouginage is successful, dilatation from below upward may be attempted. Before the author's split cannula carrier and the rubber laryngeal tube are finally inserted, bouginage should be performed three or four times so that the larynx is thoroughly opened.

O. M. ROTT.

Moore, I.: The Epidiascopic Demonstration of the Normal Histology of the Vocal Cord and Ventricle of the Larynx Considered in Connection with the Development of Adenomata. *Proc. Roy. Soc. Med., Lond., 1919, xii, Sect. Laryngol., 199.*

Photomicrographic demonstrations of sections of the larynx are presented in order to determine the limits of the vocal cord and to settle the question as to whether or not it is possible for an adenoma to develop from this structure. The conclusion offered is that the cord contains gland tissue in the peripheral portion of the upper half of the cord and that therefore an adenoma may arise from this structure.

O. M. ROTT.

MOUTH

Leary, A. J.: The Relation of Oral Infection to Systemic Disease. *Boston M. & S. J., 1919, clxxxi, 611.*

Leary reports that it is now conceded that oral infection may be the cause of rheumatic attacks which, in the past, were attributed to uric-acid diathesis, auto-intoxication, internal secretions, or anaphylaxis. Focal infections from the roots of devitalized teeth are among the most certain, frequent and insidious underminers of health for the following reasons:

1. They occur without giving rise to any local pain or discomfort.
2. They may be present about the roots of teeth which supposedly have been well filled.

3. Their presence is usually revealed only accidentally or intentionally with the X-ray.

4. Often their presence about the roots of septic teeth may not be revealed by the X-ray.

5. The effects of these local infections are remote from their origin both in time and place, and there is no apparent connection between the two.

6. Hardly a person over 25 years of age who has had dental treatment in which the pulp has been involved is without one or more of these apical infections.

7. These infections are most puzzling to the oral surgeon and require his most skillful efforts to eradicate them.

M. N. FEDERSPIEL.

Zentler: The Combined Operation for Peri-Apical and Peridental Infection; the Reason for Author's Technique. *Internat. J. Orthodont. & Oral Surg., 1919, v, 586.*

Zentler reports a combined operation for peri-apical and peridental infections. He recommends the complete removal of the diseased area. This is usually done with the surgical burr so as to smooth the amputated root-end as well as any sharp edges of the surrounding bone. A normal saline solution is used to wash away shavings.

In peridental infection the diseased part is well exposed. All the inflamed, infected, granulomatous tissue found between and surrounding the roots of the teeth is removed. The area operated upon is swabbed with a 50 per cent solution of the official tincture of iodine and the flap then sutured in place.

M. N. FEDERSPIEL.

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SURGERY OF THE EYE AND EAR

Eye

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Serpiginous ulcer of the cornea and its treatment. W. O. NANCE. Illinois M. J., 1919, xxxvi, 182. [230]

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Choroidal carcinoma, bilateral metastasis from the breast. G. M. McBEAN. J. Am. Inst. Homœop., 1919, xii, 511.

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SURGERY OF THE NOSE, THROAT, AND MOUTH

Nose

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The submucous resection operation; with report of a case. M. LUBMAN. *N. York M. J.*, 1919, cx, 847. [233]

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Throat

Hæmolytic streptococci in the nose and throat, with special reference to their occurrence after tonsillectomy. M. S. TONGS. *J. Am. M. Ass.*, 1919, lxxiii, 1050. [233]

Removal of tonsils and adenoids. C. J. SYMONDS. *British M. J.*, 1919, ii, 558. [233]

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Laryngeal bouginage. H. L. LYNNAH. *N. York M. J.*, 1919, cx, 838. [233]

The epidiascopic demonstration of the normal histology of the vocal cord and ventricle of the larynx considered in connection with the development of adenomata. I. MOORE. *Proc. Roy. Soc. Med., Lond.*, 1919, xii, Sect. Laryngol., 199. [234]

Mouth

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The relation of oral infection to systemic disease. A. J. LEARY. *Boston M. & S. J.*, 1919, clxxxi, 611. [234]

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Retracting and suturing of soft tissues with regard to extraction of the impacted lower third molar. B. S. GARDNER. *Dental Cosmos*, 1919, lxi, 1092.

Histopathology of the jaws and apical dental tissues. IV. Degenerate root structures. E. S. TALBOT. *Dental Cosmos*, 1919, lxi, 1067.

INTERNATIONAL ABSTRACT OF SURGERY

APRIL, 1920

ABSTRACTS OF CURRENT LITERATURE GENERAL SURGERY—SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE

Derache: The Treatment of Ulcerous Cicatrices by Circumferential Incisions (Note sur le traitement des cicatrices ulcéreuses par les incisions circonférencielles). *Arch. méd. belges*, 1919, lxxii, 60.

The author believes that in extensive ulcerations arising from the scars of wounds the best treatment is that recommended by Dolbeau for varicose ulcers, i.e., circumferential incisions.

These incisions, which should include the skin and the entire thickness of the subcutaneous layers, are made parallel to the scar at a distance of from 2 to 3 cm. from the edge of the diseased tissue. A double line may be made on each side.

The incisions diminish the tension on the scar and facilitate the circulation and nutrition of the cicatricial tissue.

The cure obtained by this treatment is often rapid. The ulceration in the center of the scar quickly changes its aspect and becomes covered by a crust.

The method is very efficacious in rebellious scar complications against which the surgeon is often powerless. The author has used it extensively and almost always successfully. In one case the incisions were made eight months after the injury. Less than fifteen days later the ulcer was entirely cicatrized although the operative wounds were not.

W. A. BRENNAN.

Eisendrath, D. N.: Drainage of the Abdominal Wall in Acute Appendicitis. *J. Am. M. Ass.*, 1919, lxxiii, 1871.

The author uses the McBurney muscle-splitting incision for appendectomy and finds that it is large enough for the removal of the majority of appendices. To prevent abdominal-wall infections he employs a special arrangement of drains. The first drain, which is of rubber tubing, is passed through the center of the incision to the peritoneum which has been closed. The second drain, of the same

material, lies upon the internal oblique muscle parallel to the line of incision and emerges at the angles. The third drain, made of twisted strands of silkworm gut, lies upon the external oblique muscle parallel to the second drain and also emerges at the angles. These drains are ordinarily removed with the sutures.

"In cases in which an abscess has been formed, the peritoneum is not closed, but a cigarette drain is inserted to the bottom of the abscess cavity." Pelvic abscesses and spreading peritoneal infection complicating appendicitis are drained by a suprapubic stab wound, and the McBurney incision is closed as described.

K. L. VEHE.

Ducuing, J.: Late Suturing of Wounds (Sur le rapprochement tardif des plaies). *Lyon chirurg.*, 1919, xvi, 270.

Ducuing sutured 75 wounds in the late period, i. e., about thirty-five days after the injury when the wound was in the course of cicatrization. In 40 per cent the results were perfect; in 20 per cent they were good, about one-third of the wound remaining open; and in 10 per cent they were fair, about two-thirds of the wound remaining open. In 5 per cent the result was a failure.

Ducuing states that owing to its bacteriological and anatomopathologic character the approximation of an old wound is more difficult than a primary or late primary union of a wound freshly disinfected. The operation often frees hidden bacteria. The special precautions which must be taken in late-sutured wounds are as follows:

1. The wound must be closed before it reaches too late a state in its evolution. Statistics show that the proportion of failures is very much higher in late than in primary or secondary approximations.

2. Contrary to the opinion of many surgeons, however, a late approximation may be made safely and on the basis of the clinical aspect alone if the wound appears to be in good condition for healing. Under such conditions the clinical examination

gives as much information as the bacteriological examination as the bacteria are usually latent.

3. Before a late suture is made it is desirable to determine by what methods deep sterilization of the wound may be effected. Possibly this may be obtained by ionization or roentgenization.

4. In closing the wound the necessary excision may be limited to a trimming, but extensive excision extending into the healthy parts may be necessary to obtain a supple wound. Mere curettage of the wound edges leaving a good deal of the indurated parts is not recommended.

5. In trimming the skin and approximating the muscle layers the formation of dead spaces must be avoided. These harbor bacteria and favor bad contacts between the phagocytes and the micro-organisms.

6. When hæmostasis is not perfect subcutaneous or submuscular filiform drainage is indicated.

7. Very violent traction on the skin to close a wound should be avoided. These manœuvres interfere with the circulation of the cutaneous strips and underlying layers and favor non-union. It is better to make only an approximate closure.

8. Fever following the operation does not necessitate a total opening of the wound. As a rule such opening is not called for even when there is persisting fever and pain. The removal of a few stitches at the point which is most tense and red, followed by the application of a wet dressing, is usually sufficient.

9. Total failure of late suture is not a complete therapeutic failure as it always leaves a more supple wound which generally heals better and after rapid disinfection can be resutured. W. A. BRENNAN.

ASEPTIC AND ANTISEPTIC SURGERY

Fantus, B., and Smith, M. I.: An Experimental Study of the Action of Chloramines. *J. Pharmacol. & Exper. Therap.*, 1919, xiv, 259.

The authors studied the effects of sodium P-toluene sulphonchloramine (chloramine-T), P-toluene sulphonamine and its sodium salt, and P-toluene sulphonichloramine (dichloramine-T) on protozoa, frogs, guinea pigs, rabbits, and dogs.

Unicellular animals were promptly killed by very dilute solutions of the soluble chloramines. The chloramines are powerful irritants, causing inflammatory œdema of the subcutaneous tissue and even necrosis of the overlying skin on hypodermic injection, inflammation of the mucous membranes on local application, and vomiting on oral administration. The effect on the mucous membranes was studied in the conjunctiva of rabbits. A 1:1,000 solution of chloramine-T was distinctly irritating while a 1:2,000 solution was not. Chloramine-T is therefore about three times as irritating as phenol.

Chloramine-T depresses the central nervous system in the order of brain, medulla, and spinal cord. This was easily demonstrated in the frog but is probably true also as regards the higher animals.

The depression is due chiefly to the P-toluene sulphonamine. On intravenous injection, chloramine-T produces pulmonary œdema which is probably the same as that produced by the inhalation of chlorine gas.

The fear has been expressed that wound irrigation with the chloramines might be dangerous because of their tendency to produce methæmoglobin. The hæmolytic power of chloramine-T is due chiefly to its alkalinity. This is evident from the fact that the same power is displayed also by chlorine-free sodium P-toluene sulphonamine. P-toluene sulphonamine containing no dissociable alkali is not hæmolytic. Methæmoglobin formation due to the chlorine in chloramine-T occurs only to a slight degree and is shown only in the test tube. Dichloramine-T is also slowly hæmolytic and slowly changes hæmoglobin to methæmoglobin. I. W. BACH.

ANÆSTHESIA

Mortimer, J. D.: Postgraduate Lecture on the After-Effects (and So-Called After-Effects) of Anæsthesia. *Med. Press.*, 1919, n.s., cviii, 505.

Mortimer concludes that it is a mistake to attribute so many post operative conditions entirely to the anæsthetic. While in some cases the anæsthetic or its maladministration may be the sole cause, in others it may have merely contributed to the condition and in others it would be hard to trace to it even a remote share in the responsibility.

Depression and collapse should not be attributed directly to the anæsthetic save in quite exceptional cases. As a general rule the patient's previous state, hæmorrhage, stridor, or other reflex disturbances leading to surgical shock, are quite enough to account for the condition. Moreover, if the anæsthetic has been improperly selected or badly given, its administrator must be considered responsible.

Excitement and struggling are less usual during recovery from the anæsthetic than during the induction of anæsthesia, but may occur in neurotic or alcoholic patients, especially if they are disturbed. An attack of delirium tremens may be precipitated by anæsthesia but the anæsthetic counts for little in its causation.

Insanity rarely follows operation immediately, but may come on during the first two or three weeks afterward in predisposed subjects. Here, again the anæsthetic may be considered only one of many contributing factors.

Vomiting is more apt to occur in sensitive persons, in dyspeptics, in the over-fed, and in those in whom excretion is inadequate. Faulty preparation, oral sepsis, swallowing of mucus or blood, faulty after-treatment, such as jolting, feeding too soon, etc., however, are often contributory factors. There is also the possibility that the disorder for which the operation was needed, such as intestinal obstruction, has not been fully relieved. Again, the surgeon's procedure may unavoidably cause after-vomiting

by direct or reflex action, or the operations and bandages may interfere with oxidation and the elimination of the anæsthetic and waste products. Vomiting is more apt to occur when sensitive organs are stitched than after their removal, and is sometimes associated with spasmodic pain. One must beware of the after-complications of which vomiting is a symptom, i. e., peritonitis, etc.

Any operation in the region of the diaphragm inhibits its action, thus allowing atonic distention and nausea.

Prolonging the anæsthesia does not in itself greatly increase the tendency to vomiting. It should be remembered that in cases requiring a long operation other causes of after-vomiting are present more often than in cases requiring a short operation. As a rule nitrous oxide and ethyl chloride do not cause vomiting unless blood is swallowed. After ether, vomiting is more usual, but occurs only once and then usually before the return of consciousness. There is no special tendency to vomiting from a mixture of chloroform and ether. Chloroform is followed by vomiting less often than ether, but when it is so followed the vomiting is apt to be prolonged and serious. Vomiting is a marked symptom in a condition known as "delayed chloroform poisoning."

To overcome retching and vomiting a small tumblerful of hot water in which a teaspoonful of bicarbonate of soda has been dissolved should be slowly sipped. This will clear the stomach one way or the other. If the patient complains of the taste or smell of the anæsthetic, his mouth should be rinsed, and he should suck a thin slice of lemon or inhale aromatic vinegar.

The urine should be tested, especially if there is a possibility of acetonuria or uræmia. Examination of the fundus oculi may give early indication of an intracranial disorder. Presuming that there is no evidence of any condition requiring further operation, sedatives, such as bromides, may be given to neurotic patients, or morphine if there is persistent pain or irritation. The latter drug must be used with caution, for if the sickness depends on imperfect elimination, morphine makes matters worse as it may cause intestinal atony and mask complications.

Lavage of the stomach is especially valuable when the stomach is apt to contain decomposing material. The author urges that it be done as a matter of routine after any operation for intestinal obstruction. The bowels should be well cleared. If there is atonic distention, strychnine, ergotinine, eserine, or pituitrin is recommended unless the patient has high blood pressure or a weak heart. Abdominal massage should be given when possible. If necessary, a rectal tube may be left in place for an hour or so at a time. The Fowler or sitting-up position is advisable.

As regards postoperative pulmonary complications, it was shown by Pasteur in 1911 that these are due mainly, not to the anæsthetic, particularly

the irritating vapor of ether, as was formerly supposed, but to inhibition of the action of the diaphragm caused by bronchopneumonia and operations to collapse the lungs. Among many other predisposing and exciting causes may be mentioned catarrhal and septic conditions of the air-way, lack of general resistance, chilling, over-dosing with ether, inhalation of fluid, the use of dirty apparatus, the dorsal position, and hypnotic drugs. Œdema of the lungs may follow excessive intravenous infusion, while pulmonary embolism, septic or non-septic, may occur especially after operations involving large veins. Careful selection and administration of the anæsthetic, measures to secure a free air-way and prevent inhalation of fluids, and the use of oxygen and atropine in certain cases are obvious safeguards.

ISABELLA HERB.

Farr, R. E.: Some Adjuncts Which Promote Efficiency in the Use of Local Anæsthesia.
Am. J. Obst., 1919, lxxx, 653.

A brief review of the problem of anæsthesia discloses the fact that modern anæsthetics are far from perfect. From the standpoint of safety, both immediate and remote, procaine is the most satisfactory.

The author claims that it is possible to perform a large amount of surgical work under local anæsthesia, but that before the method is generally adopted the armamentarium and the technique of producing anæsthesia must be improved and simplified and present-day methods of operating must be changed.

The article contains a description of a method of introducing the anæsthetic which is painless except for the formation of the initial wheal. The method of choice is infiltration when it does not interfere with the anatomical relation of the tissues, but in some cases, hernia for example, nerve blocking is recommended. Abolition of the reflexes of the abdominal wall is the ideal as this invariably gives a negative intra-abdominal pressure and the viscera recede rather than extrude from the operative wound.

In the technique, vertical retraction and great care in the handling of the tissues are the main strategic points. Abdominal packs are unnecessary except to prevent soiling.

Particular attention is called to the great efficacy of local anæsthesia for operations upon children. For some years the author has been using this method with considerable success, even for children as young as two days. Among the operations performed were appendectomies, herniotomies, transpositions of the testicle, the Rammstedt operation, closure of spina bifida, circumcisions, operations for cleft palate, dissections in the neck, trephining, and work on the extremities. The facts mentioned regarding the technique are even more important in the cases of children than in operations upon adults.

Some of the advantages of local anæsthesia are its safety and comfort and the greater efficiency it affords in operating.

SURGERY OF THE HEAD AND NECK

HEAD

Rivarola, R. A.: Tumors of the Brain in Children
(Los tumores del encefalo en los niños). *Semana méd.*, 1919, xxvi, 636.

In a study of the case reports in the literature Rivarola is impressed by the length of time that usually elapses between the first examination of the patient and the operation. It has been said that this delay is due to the difficulty of making a diagnosis but there have been cases in which, though the diagnosis was made definitely, operation was postponed for months and in one instance for a year and a half during which time futile treatments with mercury were given. Such a state of affairs deserves severe criticism.

The author's experience was wholly with patients under 15 years of age and he therefore does not assume to generalize concerning adult patients. It appears to him, however, that there is a manifest difference between the condition in children and in adults. In children tuberculoma is much more frequent than in adults, while in adults syphiloma is very much more frequent than in children. The difference between brain tumors in children and in adults which Rivarola wishes to emphasize particularly, however, is that of the symptoms presented. It is useless, he believes, to seek the same symptoms in children which adults present under similar circumstances.

Tuberculous tumors are the most common of the brain tumors in children. Hydatid cysts are next in frequency, and then follow gliomata, gliosarcomata, psammomata, etc. Early diagnosis is essential in order that rational treatment may not be delayed.

In the majority of cases the early diagnosis of tumor of the brain in children is not a matter of great difficulty, and inability to make a diagnosis is usually due to faulty examination or insufficient knowledge of the normal functions of the different regions of the brain and nervous system.

To make a prompt diagnosis it is necessary to know the various symptoms that make up the compression syndrome. In children this syndrome is represented by four cardinal symptoms which are almost never absent and nearly always associated, i.e., headache, vomiting, constipation, and edema of the papilla.

Operation to be successful must be done early. A tumor of the brain is always a grave condition. Left to itself, it leads slowly and surely to death. If operation is delayed until after the tumor has had months in which to develop the patient is emaciated and unable to withstand the treatment. To operate early is to do the greatest possible good. If the tumor is extirpated the disease is cured at least temporarily. If the tumor cannot be extirpated the

craniotomy will relieve the symptoms of compression and hypertension.

It seems to Rivarola that as regards operation the nature of the tumor is of little consequence. The only form for which operation is not indicated is the syphiloma. A tuberculoma should always be removed. If it is solitary it should be extirpated and the patient afterward appropriately treated for the primary tuberculous infection to which the brain lesion was secondary.

Lumbar puncture for examination of the spinal fluid does not assist in the diagnosis and is not without danger. Therefore it should not be practiced regularly, and when for any reason it is necessary, it should be done with the child in the recumbent position and only a very small quantity of fluid should be withdrawn. Neither is roentgenography of any great assistance in the diagnosis except when there is spreading of the sutures or deformity of the sella turcica in tumors of the hypophysis. The intradermal tuberculin reaction, the Wassermann reaction, Ghedini's reaction, etc., are of no particular value in establishing the nature of the tumor.

The effect of the radio-active substances in the treatment of tumors of the brain is still to be established.

M. M. MATTHIES.

McCaw, J. F.: Gangrene of the Temporosphenoidal Lobe, Right Side, of Otic Origin—Operation and Extensive Excision of the Lobe—With Recovery. *Ann. Otol., Rhinol. & Laryngol.*, 1919, xxviii, 823.

McCaw reports a case of gangrene of the temporosphenoidal lobe complicating a chronic suppurative otitis media of twenty years' duration which had undergone acute exacerbations. During one of the exacerbations operation was performed and the dura was found to be greenish and gangrenous. As incision of the dura revealed a similar condition of the brain, the greater portion of the temporosphenoidal lobe was cut away with the forceps and scissors. This was of the consistency of soap and greenish and gangrenous throughout. There was no bleeding. Normal brain tissue was not entered. The excavated cavity in the brain was 3 in. inward and $3\frac{1}{2}$ in. forward from the surface of the wound. The patient made an uneventful recovery. From a mental and moral pervert he was restored to the community as a reliable and fairly good citizen.

Two months later a plastic operation was performed for a small cerebral hernia about $\frac{1}{2}$ in. in diameter. The flaps were elevated thoroughly and the entire wound lightly curetted. A flap fashioned from the posterior flap of the mastoid wound, including the periosteum and overlying tissues except the skin, was then cut free at its lower part, carried upward and forward, and sutured to the

periosteum at the upper and anterior part of the wound. This covered the hernia and gave it support. Further support was given by another flap made from the posterior auditory canal to enlarge the meatus which was carried upward and backward and sutured to the upper part of the posterior wound flap.

O. M. ROTT.

Pieri, G.: Gunshot Wounds of the Medulla and Meninges (*Le ferite d'arma da fuoco del midollo e delle meningi*). *Chir. d. organi di movimento*, 1919, iii, 257.

Pieri's study of spinal-cord injuries is based on 110 clinical cases observed during the war: 110 lesions of the meninges and cauda, 9 lesions of the meninges.

Of the 110 meningeal and caudal lesions, 40 were rifle bullet injuries, 55 were due to shrapnel, 11 were caused by grenades, and the balance due to larger firearms.

The study of these cases demonstrates the diverse course of the projectiles:

1. Traversing the spinal column and injuring the medulla or the cauda directly.
2. Traversing the spinal column with injury either to the medulla (or cauda) or the meninges.
3. Striking and fracturing the arcs at a tangent, and, in ricocheting, producing irreparable lesions in the underlying medulla (6 cases).
4. Striking a vertebral body directly and, becoming embedded therein, producing a severe indirect lesion of the cord (2 cases).

The data studied show that war projectiles by their characteristic ballistic properties injure in their passage through the vertebral column principally the cord. The medullary injury is indirect. The projectiles commonly removed in civil surgery, on the other hand, injure the medulla by their presence in the spinal canal and the injury is essentially direct.

The anatomopathologic study of these lesions is based on 41 autopsies and 15 biopsies. In cases of clinically total lesions in which the state of the cord was directly verified at autopsy or operation there were 7 types of cord lesion:

1. Complete section of the medulla and of the pia with diastasis of the stumps as well as lesions of the dura (7 cases).
2. Apparently complete section of the medulla, but not of the pia, with lesion of the dura (1 case).
3. More or less extensive disruption of the medulla and of the pia with lesion of the dura (6 cases).
4. More or less extensive section of the medulla and of the pia and a lesion of the dura (6 cases).
5. Complete through and through perforation of the medulla, pia, and dura (2 cases).
6. Intracanal softening of the medulla with integrity of the pia and dura (10 cases).
7. External macroscopic integrity of the medulla and meninges (6 cases).

In 72 of the 110 cases the lesions were found to

be total, in 22 partial, and in 16 caudal. The partial lesions in 15 cases were of the bilateral type. Five of the 22 seemed attributable to a direct lesion, 7 to an indirect lesion, and 10 to a unilateral lesion.

Of the caudal lesions 10 appeared to be of destructive type, while 6 were transitory and appeared to be due to a contusion.

The results in the 110 cases were as follows:

1. There were 50 deaths in 72 cases of total lesion. The 22 survivors were transferred to other hospitals without signs of improvement.

2. Of the 22 patients with partial lesions 5 died and 17 were transferred improved.

3. Of the 16 patients with caudal lesions, 7 died and 9 were transferred either cured or improved.

The statistics of the 110 cases, therefore, show 62 deaths, 22 cases in which there was no improvement, and 26 cases in which the condition was improved or cured.

Only 28 of the 110 patients were operated upon, and of these, 19 died, 4 were benefited and 5 were transferred to another hospital in an unchanged condition. In 22 cases the operation consisted of extraction of the projectile. In 2 cases the projectile was not extracted because it was embedded too deeply in the vertebral body. In 6 cases an operation was performed as it was believed that the cord was compressed by fragments of bone. In 1 of these cases no bone lesion was discovered; in 3 the bone injuries did not cause the cord symptoms; in 2 the bone lesions were very severe and the cord injury was irreparable.

In 56 cases in which a direct examination of the local anatomical conditions was possible appreciable bone lesions were lacking in 10 and in the other 46 the lesion either did not cause compression of the cord or was too severe and the cord was irreparably injured. Excluding from the indications the cases of transfossal wounds, there remain those in which the projectile was embedded in the spine (30 cases in 150), those in which the projectile was outside the canal (13 cases in 33), and those in which it was partly or wholly in the canal (20). Indications for operation are given only in such cases and those in which there is only a partial lesion of the cord or of the cauda. In the total number of wounds observed, therefore, there were clear indications for operation in only 7 cases out of 110.

The conclusions to be drawn from the anatomopathologic and clinical study of these cases and from the results obtained are:

1. Total lesions of the spinal cord contra-indicate operation because of the inefficacy of suture of the cord. Cord lesions produced by modern war weapons, moreover, appear to present anatomical conditions which are least adapted to suture (in 38 cases of total lesion observed at operation or autopsy only 8 showed a clean complete section; in the 2 cases in which suture was done it was not beneficial).

2. Lesions of the cord due to transfossal wounds contra-indicate operation. An operation would not

permit the repair of cord lesions nor, except in very rare cases, the removal of the agents of compression such as clots which might be eliminated by lumbar puncture or bone fragments.

W. A. BRENNAN.

Martin, B.: Fat Transplants in Traumatic Epilepsy (Ueber Fettransplantation bei traumatischer Epilepsie). *Deut. med. Wchnschr.*, 1919, xlv, 1011.

Martin gives the clinical histories of 5 cases of traumatic epilepsy in which fat grafts were used.

The macroscopic and microscopic examination in some of these cases showed that the greater part of the graft disappeared and was replaced by connective tissue the morphological structure of which was preserved. Part of the graft became necrotic and encapsulated.

For some time after the placing of the graft the patients were entirely free from attacks, but the seizures soon recurred and were so intensified that it was necessary to remove the remnants of the grafts.

The interposition of a soft elastic body to remove the pressure and irritation of scar tissue on the brain is therefore only temporary and the capsulated graft ultimately forms adhesions with the brain.

The results in the 5 cases reported demonstrate that the method is of no value as a means of treating traumatic epilepsy. A relapse occurred in 3 of these cases within a very short period. The healing of the wound in all was without reaction. The patients showed improvement for a longer or shorter period but only one remained without an attack for nine months after the operation and he suffered violent pain in the head.

W. A. BRENNAN.

Joseph, J.: Plastic Operations on the Face, Especially Rhinoplastics (Zur Gesichtsplastik mit besonderer Berücksichtigung der Nasenplastik). *Deut. med. Wchnschr.*, 1919, xlv, 959.

Joseph had an extensive number of cases for plastic surgery during the war and sums up the conclusions based on this experience as follows:

1. In the use of flaps from the cheek to correct defects in the nose, a flap should be taken from both sides. In the cases of women the skin of the arm is usually preferable.

2. In the construction of a missing septum a bridge may be made from the cheek flap.

3. In cases of a defect of the lower part of the nose the mucous membrane may be replaced by forming a flap from the skin of the upper part of the nose and suturing it to the inner edge of the wall of the pulled-down nasal stump. The large outer round surface may then be covered with skin from the forehead, cheek, or arm.

4. In total and subtotal rhinoplastics defects in the mucous membrane may be corrected with flaps from the surrounding cheek tissues so formed that their skin surface is placed inward and wound surface outward, and one of them replaces the lower and the other the upper half of the defective nasal

membrane. The remaining defects may then be repaired with material from the forehead, arm, or the cheek.

5. In defects of the nasal alæ the missing part may be supplied with a flap formed from the skin immediately overlying it and the surface then covered with a skin strip taken from the forehead, cheek, or arm.

6. Small nose tip defects should be repaired with pedunculated skin flaps from the skin of the bridge of the nose.

7. Secondary forehead defects should be at once covered with one or two sufficiently large pedunculated flaps from neighboring areas.

8. To obtain a normal profile in cases of flat or newly formed noses, two or three pieces of wedge-shaped bone may be used.

9. When in nasal and other facial defects other methods are not applicable or give imperfect results, a last resource is transplantation of skin from the outside of the upper arm. The arm should be placed in position with the elbow in front of the chin and the hand upon the opposite shoulder.

10. Defects of the upper lip as a rule should be corrected with skin flaps from the cheek or throat taken from both sides. The red part of the lip may be formed from the mucous membrane of the lower lip.

11. Defects of the lower eyelids may be repaired with the forehead skin, and a combination of nose and eyelid defect corrected by means of a bridge transplanted from the forehead to the nose region.

Joseph describes the various methods in detail and gives a number of photographs to illustrate his results.

W. A. BRENNAN.

Shaw, D. M.: Perverted "Functional" Activity in the Production of Jaw Deformities. *Internat. J. Orthodont. & Oral Surg.*, 1919, v, 724.

In this article the author confines himself to a consideration of the jaw deformities occurring in children which are recognized chiefly as irregularities or abnormalities in the position of the teeth. He reviews some of the theories advanced as to the etiology of these deformities, such as those ascribing them to a lack of functional exercise due to the ingestion of soft foods exclusively, faulty pituitary secretion, and defects or wrong use of the respiratory parts. He points out that some of the explanations offered are diametrically opposed.

Shaw has searched for positive factors by closely observing large numbers of children in the act of masticating. He observed in many cases an excessive amount of manipulation of the food by the tongue. Reduction of the food by the cheek teeth was carried out only partially or not at all. Morsels were rolled about and squeezed by the tongue and bolted. A large proportion of the daily intake was manipulated and mashed by the tongue against the anterior surface of the palate. In some cases tough morsels were reduced by the anterior teeth, the cheek teeth being absent, carious, or in malocclusion. In this act

also the tongue was used abnormally as regards direction, force, and time.

This abnormal and perverted use of the tongue, the author believes, is a positive factor in the production of protrusion of the upper jaw and the following abnormalities found associated in a majority of such cases: (1) the high level obtained by the alveolar anterior border of the mandible; (2) shortening of the body of the mandible; (3) increased depth or low level of the premolar and molar region in the maxilla and mandible; (4) narrowing of the arches; and (5) a backward bite of all or nearly all of the mandibular teeth.

The tongue is pulled forward by the geniohyoglossal muscles which will exert a backward pull upon the mandible. Its upward thrust will be accompanied by an upward pull on the mandible through the same muscles, while the mylohyoid muscles furnish the base upon which the tongue rests. Abnormal perverted activity on the part of the tongue in these directions during the period of development of the jaws will bring about the deformities enumerated.

The action of the tongue produces the protrusion of the upper jaw, that of the geniohyoglossi raises the level of the incisive border of the mandible and shortens its body. Downward pressure of the tongue on the mylohyoid diaphragm causes the low level of the premolar and molar region, narrowing of the arches, and a tipping in of all the lower cheek teeth.

LOUIS SCHULTZ.

NECK

Beck, J. C.: Experiences in the Surgery of the Thyroid Gland. *Ann. Otol., Rhinol. & Laryngol.*, 1919, xxviii, 728.

Operation should be performed in cases of exophthalmic goiter not cured by the removal of septic foci; on thyroid glands interfering with respiration, speech, or digestion, or causing laryngo-tracheal cough; on large thyroids when the patient so desires for cosmetic reasons; and in cases of primary malignancy of the thyroid.

Beck gives $\frac{1}{4}$ gr. morphine with $\frac{1}{150}$ gr. atropine one-half hour before operation and $\frac{1}{8}$ gr. morphine at the beginning of the operation. He prefers local anæsthesia induced by 1 per cent apothesis or procaine solution to general anæsthesia, but while handling the gland, especially in the depths of the neck, he adds nitrous oxide and oxygen by mouth tube. General anæsthesia he uses only for very nervous patients and even in such cases begins the operation under local anæsthesia.

Catgut ligatures are used and the vessels are tied off early. As a rule portions are removed from both lobes to make the neck symmetrical. In advanced malignancy tracheotomy may be required and resection of the clavicle may be necessary to reach the trachea below. In many of Beck's cases no drainage was used and the lack of it did not seem to have any unfavorable effect.

The article includes also a description of the

technique of orbital decompression for the management of exophthalmos, as well as seventeen short reports of various types of cases, four of which were cases of lingual thyroid.

C. R. STEINKE.

Means, J. H., and Aub, J. C.: The Basal Metabolism in Exophthalmic Goiter. *Arch. Int. Med.*, 1919, xxiv, 645.

This discussion is based on 345 metabolism observations made on 130 patients and covering a period of four and one-half years.

The gas exchange of persons with hyperthyroidism is elevated above the normal. Accordingly the degree of elevation may be used as a measurement of the degree of thyroid intoxication.

In the investigations reported the basal exchange was determined with the Benedict universal respiration apparatus and the heat production calculated therefrom. Up to April, 1917, the writers used the calorific value of oxygen for the respiratory quotient obtained, but after that time they determined the oxygen only and assumed a respiratory quotient of 0.82. The body surface was determined from DuBois' height-weight chart.

It was shown that the elevation in the metabolism in thyrotoxicosis runs parallel to the clinical evidence of intoxication.

Tables are presented to illustrate the importance of metabolism determinations for purposes of differential diagnosis in cases of obscure thyroid disease. Table 2 shows that for the most part patients with goiters but without clinical signs of thyrotoxicosis have a normal metabolism and do not become toxic subsequently. Table 3 indicates that in cases with suggestive symptoms patients with a normal metabolism do not develop exophthalmic goiter subsequently, while those with an elevation often do.

By means of the basal metabolism as an index of toxicity, the authors sought to determine the effect of roentgen-ray therapy and partial thyroidectomy on the course of exophthalmic goiter. There are always confusing factors, however, such as rest and drugs, and the tendency to spontaneous recovery.

1. The effect of rest: In a group of patients the average metabolism at the beginning of a period of complete rest in bed was +81 per cent and after from one to three weeks +62 per cent. In not a single case in the series was the metabolism brought to within normal limits by rest alone.

2. The effect of quinine hydrobromide: The average metabolism was +58 per cent before the drug was administered and +47 per cent after its administration, the fall being therefore no greater than that obtained by rest alone.

3. The effect of the roentgen ray: Under roentgen ray treatment the group as a whole showed progressive improvement as measured in terms of the metabolism.

4. The effect of surgery: A marked fall in the metabolism immediately after lobectomy, followed

by a secondary rise, was common, though not invariable.

5. Comparison of roentgen-ray therapy and surgery: In the third year after treatment was well established, the end-results in the surgical and roentgen-ray groups were identical, i.e., group averages of +13 per cent in each case and all the patients leading normal lives. In the roentgen-ray group the improvement was gradual but progressive. In the surgical group a sudden marked improvement was followed by a subsequent relapse. In groups of cases of equal toxicity it would seem that the chance of cure in exophthalmic goiter is as good with roentgen-ray treatment as with surgery.

6. The relationship between metabolism, weight, and pulse: In about 60 per cent of the cases there was a close parallelism between the pulse and the metabolism, and in the remainder a certain amount

of parallelism. This indicates that during rest the pulse rate is a fairly good index of the patient's progress.

In about 20 per cent of the cases there was some evidence of a reciprocal relationship between the body weight and the metabolism curve, but in 80 per cent there was none. In some cases the weight increased with a rising metabolism and vice versa.

No constant relationship of the sugar curve to the end-result could be demonstrated.

The authors believe that the roentgen ray should be tried first in the management of exophthalmic goiter and that resort should be had to surgery only after the roentgen ray and other medical measures have failed. Moreover, if the metabolism remains elevated after operation the roentgen ray should be employed again.

E. H. POOL.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Graham, E. A.: *The Maximum Non-Fatal Opening of the Chest Wall.* *J. Am. M. Ass.*, 1919, lxxii, 1934.

In a previous article with P. D. Bell, the author presented evidence to show that the prevalent conceptions of the collapse of one lung and the maintenance of respiration with the other in a unilateral open pneumothorax are erroneous. Unless the mediastinum is very firmly fixed with adhesions, the pressure is practically the same in the unopened as in the opened side. It has been shown also that a bilateral open pneumothorax in a normal chest is not more dangerous to life than a unilateral opening, provided the combined areas of opening on the two sides are no larger than the area of opening on one side. The writers arrived at the following formula for determining the maximum non-fatal opening of the chest wall:

$$X = \frac{V - \frac{R_1}{R_2} T}{\frac{R_1}{R_2} T} a C$$

Here V is the vital capacity; R_1 is the rate of respiration before the opening is made; R_2 is the rate of respiration after the opening is made; T is the tidal air (approximately 500 c.c.); a is a factor less than 1 (assumed to be 0.8); and C is the area of the glottis (about 2.25 sq. cm.).

The vital capacity they believed to be 3,700 c.c. Since then, Graham has become acquainted with the work of Peabody and Wentworth, in which it is shown that the average vital capacity is greater in men (being about 4,633 c.c.) and that it varies con-

siderably with the height of the individual. If these values are used, the area given by the formula would of course be greater. This may explain the criticism that the opening allowed by the Graham and Bell formula is too small. It must be remembered, however, that the apparently large openings observed in the chest wall in war surgery were actually smaller than they seemed as the gauze, the operator's fingers, the packing, and the lung itself protruding into the incision tended to reduce the actual opening and the amount of air sucked in at each respiration.

Peabody and Wentworth have verified the statement of Graham and Bell that the value of X would be diminished by the presence of any condition which would reduce the available breathing space of the lungs. They found that with pleural effusion the vital capacity varied between 74 and 42 per cent of the normal, and that following aspiration of the fluid the vital capacity increased. This increase, however, occurred after a lapse of time following aspiration, a fact which indicates clearly that in cases of acute empyema the danger of open pneumothorax created for drainage cannot be disregarded as the withdrawal of the fluid alone will not immediately relieve the patient sufficiently to make open pneumothorax safe.

R. B. BETTMAN.

Handley, W. S.: *Paget's Disease of the Nipple.* *Brit. J. Surg.*, 1919, vii, 183.

The author advances the theory that Paget's disease is usually preceded by carcinoma and that the eczematous condition is the result of carcinoma starting in the nipple.

The carcinoma originates in the smaller ducts of the breast below the nipple, usually without the formation of a palpable tumor. It then extends into the subareolar lymphatic vessel which it blocks by permeation and from there invades the more

superficial lymphatics lying just under the epithelium. As a result of this obstruction to lymph flow the skin of the nipple and the mucosa of the ducts are injured by nutritional changes. The epithelium shows disintegration and degeneration of the superficial layers and proliferation of the deeper layers. The mucosa of the larger ducts undergoes similar changes with the difference that the cast-off epithelium remains within the ducts which become plugged by a "degenerated mass of debris."

That the lymph vessels are actually plugged with carcinoma cells is shown by the appearance of the cells in the cutaneous layers. The circular groups of carcinoma cells resemble a "dilated lacteal in an intestinal villus." From these cell-groups narrower vessels presenting Y-shaped junctions extend to the subareolar lymphatic plexus. The picture is one that could be formed only by carcinoma cells occupying a preformed anatomical space.

The epidermis of the eczematous portion of the nipple is reduced to a layer a few cells in thickness. Beyond this portion the epithelium is hypertrophied. Permeation of the cutaneous lymphatics occurs over a circle 6.5 mm. in diameter, an area which is slightly larger than that showing marked epithelial changes. The subareolar or deeper lymphatics are affected over an area 10 mm. in diameter. From this concentric involvement the author infers that the latter or the subareolar plexus is the first affected as the relative size of these circles measures in terms of space the lapse of time since each of the layers was invaded.

The dermatitis is due to the permeation and blocking of the lymph flow, either in the subareolar or subdermal plexus. In chronic, longstanding cases of Paget's disease the latter often cannot be demonstrated as these groups of cells in the lymphatics are soon destroyed by disintegration and fibrosis. In those rare cases of longstanding Paget's disease in which no carcinoma has been found, the condition probably was preceded by an atrophic scirrhous which may have undergone partial cure.

The author gives a brief review of two cases and illustrates his article by one colored photograph and twelve photomicrographs.

A. E. MAHLE.

TRACHEA AND LUNGS

Pfahler, G. E.: Malignant Disease of the Lungs, Its Early Recognition and Progressive Development as Studied by the Roentgen Rays. *Am. J. Roentgenol.*, 1919, n.s. vi, 575.

The early recognition of malignant disease of the lungs is important as it may serve as a guide in the treatment. This is especially true as regards the secondary variety, the recognition of which may contra-indicate radical treatment of the primary lesion.

Pulmonary malignancy of the primary type is rare and occurs in two forms: the nodular and the infiltrating. The former, which is less common than

the latter, consists of masses of various sizes rather sharply defined and irregularly outlined, developing near the roots of the lungs as well as in the parenchyma. The latter begins at the root of the lung and gradually infiltrates the entire lung. If the malignant disease is sarcoma, it is especially apt to extend outward along the septum between the upper and middle lobe on the left side, or about the middle lobe on the right side, and this may be a fairly early sign. If the primary malignant disease is carcinoma, it consists of an infiltrating mass about the root of the lung extending outward along the bronchial tree, most frequently, the author believes, in an upward direction, a fact which serves somewhat to distinguish it from the inflammatory infiltrations about the root of the lung which tend to spread downward.

Secondary or metastatic malignant disease of the lung is found more often than the primary variety and is much more common than is generally supposed. Metastatic sarcoma consists of sharply defined nodules of various sizes occupying more particularly the parenchyma of the lungs. Hypernephroma metastasizes early to the lungs, producing a general infiltration of small miliary bodies sharply defined and extending outward from the roots of the lungs. Metastatic carcinoma occurs in four forms. The nodular type usually presents indefinitely outlined fuzzy masses of varying sizes located about the roots as well as in the parenchyma. The infiltration type, which is the most common, begins as a thickening about the hilus and shades off gradually as it extends outward. The author believes it presents more localized density without outline at the very root of the lungs than does the ordinary inflammatory infiltration; also that there is a tendency toward extension upward. The miliary infiltration type closely resembles miliary tuberculosis except that the small areas of increased density are larger, more dense, and more sharply outlined. The fourth type consists of progressive thickening of the pleura associated with pleural effusion. It is probably a direct extension of the disease from the breast. Of the cases of carcinoma of the lungs, the great majority were secondary to carcinoma of the breast. It was found that thin patients were slightly more liable to the nodular type of metastatic carcinoma, but that fat persons are much more liable to metastases than thin ones.

As a result of a study of over 200 positive cases the author draws the following conclusions:

1. Primary malignant disease of the lung is rare, but presents rather characteristic appearances roentgenographically.
2. Metastatic malignant disease of the lung is common, and should always be looked for in connection with advanced malignant disease.
3. A roentgen examination of the chest should be made in every case of carcinoma of the breast referred for operation or roentgenotherapy.
4. Metastatic carcinoma of the lungs may be one of four types: nodular, mediastinal with infiltration

about the roots, general miliary infiltration, or pleuritic.

5. Greater attention to details in these studies will lead to earlier recognition of the disease.

ADOLPH HARTUNG.

HEART AND VASCULAR SYSTEM

Smith, B. P.: A Note on Dextrocardia, Complete and Incomplete, with Four Illustrative Cases. *Lancet*, 1919, cxcvii, 1076.

Smith reviews four cases of right sided heart: two of dextrocardia and two of pseudo-dextrocardia. In the former the heart, liver, and stomach were transposed. In the latter, the heart only. The patients with true dextrocardia were healthy appearing males; the others had been sickly from birth.

The first patient complained periodically of shortness of breath on effort, pain in the chest (right), dizziness (postural), tremor, and nervousness. The second patient had been poisoned by mustard gas, and the position of the heart on the right side was found accidentally.

The two patients who had been sickly from childhood complained of shortness of breath, choking sensations, exhaustion following the slightest effort, and loss of weight. Objectively dyspnoea, cyanosis, pallor, perspiration, and the typical facies of anxiety were noted.

Smith summarizes the cases and findings briefly. The significance of dextrocardia depends entirely upon whether or not it is associated with simultaneous transposition of the liver, stomach, and spleen; if it is, it does not incapacitate the patient and is usually diagnosed by accident.

Dextrocardia without transposition of the viscera is of serious moment, the symptoms resulting from a general visceral overcrowding. Such patients invariably lay stress on the pains they experience both during effort and while resting. As the pains depend upon the visceral overcrowding, they are both local and referred, local when they denote pressure upon the intercostal nerves or brachial plexus, referred when the vagus or its intracardial endings suffer inordinate stimulation. Dextrocardia without transposition is usually, if not always, complicated by actual malformation of the heart and

great vessels. The fourth patient of this series was believed to have a perforated ventricular septum.

J. S. STRUTHERS.

Adenot and Proby: A Stab Wound of the Heart and Lung; Suture of the Right Ventricle (Blessure du coeur et du poumon par coup de couteau; suture de ventricule droit). *Lyon méd.*, 1919, cxxviii, 489.

A man who was stabbed in the left intercostal space about 2 cm. from the sternal border was received in the hospital about three hours later. A pericardiotomy was decided upon. Exploration showed the prepericardial region infiltrated with blood and a wound in the pericardium about 1 cm. long through which black blood flowed. The opening was enlarged and the heart seized and brought to the surface. A similar wound was then seen in the upper part of the anterior wall of the right ventricle. Through this the blood issued in a jet during systole. The edges of the wound were immediately sutured and reinforced and the heart returned to its place. As there was still a considerable hæmorrhage of bright blood from the region of the vessels at the base of the heart, further examination was made with the result that another wound was found in the anterior part of the lobe of the left lung. This wound was tamponed with compresses.

When the heart was brought to the surface the patient's respiration stopped and death appeared certain, but when the heart was replaced in the pericardium undulatory contractions reappeared and little by little the normal beat was regained. Following operation the general condition continued to improve, but at the end of about twelve hours there was a sudden hæmorrhage through the wound and death resulted from asphyxia.

The autopsy showed an oblique perforation between the ventricles and a wound of the posterior wall of the left ventricle. The latter was not noticed during the rapid operation as there was no issue of blood through it. The author believes that death was due to the lung wound as the hæmorrhage from this injury was severe while the pericardium contained only a little blood. The wound between the ventricles, however, would have been fatal ultimately.

W. A. BRENNAN.

SURGERY OF THE ABDOMEN

GASTRO-INTESTINAL TRACT

Stewart, G. D., and Barber, W. H.: The Gastric Hypermotility Associated with Diseases of the Gall-Bladder, Duodenum, and Appendix; A Clinical Study. *J. Am. M. Ass.*, 1919, lxxiii, 1817.

Clinical study, roentgenological examination, and animal experimentation have demonstrated a relationship between diseases of the gall-bladder,

duodenum, and appendix, and hypermotility of the stomach.

The clinical reports studied by the authors were those of cases of gall-bladder, duodenum, and appendix disease treated in the Third Division of Bellevue Hospital, N. Y., in the past eight years. The details of those accompanied by roentgenographic descriptions and operative findings are given in four tables.

Table 5 includes the results of experiments

conducted on dogs. In this series the upper abdomen was opened with the slightest possible trauma, and the effects on the contractile impulse of the stomach exerted by irritation of different parts of the intestinal tract were noted.

The results of the investigation are summarized as follows:

1. The records for the past eight years of chronic cholecystitis, with or without cholelithiasis, duodenal ulcer, and chronic appendicitis, which bear roentgen-ray notes on the gastric motor function and were verified by open operation disclose the fact that gastric hypermotility was present in 68.4 per cent of the cases of gall-bladder disease, 75 per cent of the cases of duodenal ulcer, and 55 per cent of the cases of chronic appendicitis.

2. Experiments purposely carried out in the open surgical abdomen antedating this clinical review disclosed hypermotility in 61.5 per cent of the cases of gall-bladder disease, 66.7 per cent of the cases of duodenal trauma, and 100 per cent of the cases of disease of the appendix.

3. The motor characteristics of surgical lesion of the stomach are the incisura and pylorospasm (pyloric-sphincter spasm) as they probably occur more frequently in the presence of essential disease. Diffuse pylorospasm is very often reflex.

P. M. CHASE.

Hill, R.: Congenital Pyloric Stenosis. *J. Missouri M. Ass.*, 1919, xvi, 379.

The author has operated upon 25 cases of congenital pyloric obstruction, with 16 recoveries and 9 deaths. In 14 cases treated by posterior gastroenterostomy there were 6 recoveries, while in 11 cases treated by the Rammstedt method there were 10 recoveries.

Infants with congenital pyloric stenosis who do not make an immediate gain on tube feeding should be operated upon as such cases of the spasmodic type are mild but true cases of anatomical obstruction.

In reviewing the symptomatology, Hill emphasizes especially: (1) the vomiting, which is eventually projectile and may be very severe; (2) gastric waves; (3) tumor; and (4) constipation. The infant fails to gain, then loses weight rapidly, and finally presents a picture of marasmus.

Symptoms of the condition appear between the third and sixth weeks of life. The author's statistics from 1,000 cases lead him to believe that the condition occurs in 1 of every 200 babies. K. L. VEHE.

Mathieu, A., and Moutier, F.: Giant Ulcer of the Stomach (*L'ulcus géant de l'estomac*). *Arch. de mal. de l'appar. digest.*, 1919, x, 257.

The authors give the clinical histories of three cases of giant ulcer of the stomach in men aged 49, 48, and 56 years old. All three cases came to autopsy.

From their observations the authors find that giant gastric ulcer is characterized by late pain or se-

vere dyspepsia, hæmatemesis, paroxysmal evolution with periods of remission sometimes lasting several years, final stages marked by aggravation and quick recurrence of the pain, the appearance of more or less severe pyloric stenosis, anorexia, sometimes extreme cachexia, and death from hæmorrhage of pancreatic origin. To these characteristics is added the probable discovery under radiosopic examination of a diverticular sac along the lesser curvature coinciding with that of a clearly bilocular image.

From such a syndrome the diagnosis would usually be cancer or at least ulcer with cancerous change. Clinically giant ulcer is a persistent ulcer of paroxysmal development and a terminal syndrome characterized by intense pain and cachexia; anatomically it is an ulcer of the lesser curvature stricturing the pylorus without involving it and possibly associated with considerable adenopathy.

Giant gastric ulcer is rare, a fact which is easily explained. In order that an ulcer may reach such a degree of development it must begin on the lesser curvature at a distance from the gastric openings. If it developed near an orifice, a stenosis would soon ensue and whether operated upon or not the lesion could not develop very far.

Anatomical and clinical descriptions of cases of giant gastric ulcer in the literature are scarce and the authors state that their report is the first complete study of the condition. The frequency and the gravity of the hæmorrhages are due to the perforation of the ulcer and its attack on the pancreas. The distance of the ulcer from the pylorus and its size explain its long development and the paroxysmal gastric attacks. The particular intensity of the pains is no doubt due to the immediate vicinity of the solar plexus and the sclerosis and irritation of the tissues in the pancreatic region. The pyloric stenosis found in these cases without a direct lesion of the pylorus itself might be considered as due to spasm produced at a distance by the ulcer, but though this may be theoretically acceptable, it is not correct. The direct cause is rather a perigastritis and thickening of the tissues adjacent to the lesser curvature which disturb the functioning of the pylorus and the first portion of the duodenum.

W. A. BRENNAN.

Moynihan, B.: The Diagnosis and Treatment of Chronic Gastric Ulcer. *Brit. M. J.*, 1919, ii, 765.

In Moynihan's opinion chronic gastric ulcer is comparatively rare and easily and frequently simulated by other conditions. There is still much misconception throughout the profession with regard to the disease. Diagnosis by purely clinical means is extremely difficult and uncertain. Moynihan places chief dependence upon one symptom, pain. This he discusses in detail, emphasizing the sequence of food, comfort, and pain. X-ray examination in his opinion is more accurate than all other diagnostic methods combined. Infection, localized spasm of the gastric musculature, and hyperacidity are present in active gastric ulcer, but also in varying

degree in other intra-abdominal lesions which may closely simulate ulcer.

The author believes that chronic gastric ulcers heal under treatment or after the exercise of continued care in the diet, but he is not convinced that they remain healed long. Healed ulcers of moderate or large size, on the other hand, may produce mechanical conditions requiring surgical relief. Nevertheless a serious attempt should be made to treat all ulcers by thorough medical measures, preferably the Sippy method. The necessity for surgical relief in many cases is due to a perfunctory trial of medical treatment in the earlier attacks. When a chronic gastric ulcer has refused to heal or has recurred after medical treatment, surgical treatment is necessary.

Moynihan discusses the various operative procedures used as a rule, but expresses his preference for partial gastrectomy because it does away with any chance of recurrence, gives complete and immediate freedom from all gastric trouble, and banishes the danger (great or small, but certainly real) of a cancerous change in a chronic ulcer.

G. B. EUSTERMAN.

Loeper, M.: Sarcoma of the Stomach (La sarcome de l'estomac). *Progrès méd.*, 1919, 455.

The author's case of gastric sarcoma was that of a soldier and was diagnosed only at autopsy.

On clinical examination a round tumor the size of a foetal head, which was mobile with respiration and appeared to be connected with the liver, was found in the epigastrium. At first it was believed to be a hydatid cyst, but this was ruled out by the blood examination. It was then thought to be a liver abscess but no parasites were found in the stools. The Mayer reaction was positive, however, and the appearance of the epigastrium as well as the history favored the assumption that it was cancer. Later this diagnosis was abandoned in favor of bacillary peritonitis.

Radioscopy showed a bilocular stomach with the pyloric antrum separated from the greatly distended cul-de-sac by a large clear space.

The patient was treated by heliotherapy but died of progressive cachexia.

Autopsy disclosed an enormous bosselated tumor on the anterior wall of the stomach. Numerous nodules the size of nuts studded the lesser curvature. A number of these nodules were found also in the omentum and the picture suggested glandular tuberculosis complicating bacillary peritonitis. Histologic examination of the tumor, however, showed it to be a round-cell sarcoma.

The symptoms in this case were first those of dyspepsia. These were followed by loss of weight and vomiting which progressively increased. The final stage was the development of the tumor in the epigastric region with ballooning of the whole abdomen. The diagnosis of bacillary peritonitis was based upon the examination of the material obtained by abdominal puncture.

In cases of voluminous gastric tumors the possibility of sarcoma should always be borne in mind. None of the methods of diagnosis should be neglected. Of all, the cytological examination is the best. Positive cytologic findings give assurance when clinically there can be only presumption.

W. A. BRENNAN.

Riff, A.: A Contribution to the Etiology of Appendicitis (Contribution à l'étiologie de l'appendicite). *Presse méd.*, Par., 1919, xxvii, 521.

The conclusion reached by Letulle and Aschoff after a thorough study of the pathogenesis of appendicitis were: (1) that appendicitis is not due to the spread of inflammation from the cæcum and small intestine; and (2) that the primary infection occurs in one or several epithelial lesions of the appendix itself.

Riff has found that the appendix is the habitat of the oxyuris and that this parasite is capable of causing the epithelial lesions observed in appendicitis. Its traces can be found in any freshly resected appendix in the punctiform hæmorrhages thickly disseminated over the mucous surface. Some authors have reported the finding of the oxyuris in as many as 48 per cent of extirpated appendices.

The author began the study of the parasites of the intestine in 1911. He examined a series of 152 appendices taken from patients ranging in age from 2 to 70 years and presenting all types of inflammatory lesions. He found that only 13 per cent showed no signs of oxyuris. The oxyuris was present in 48 per cent of the cases. In one appendix he discovered more than 400 of these worms.

The war interrupted the author's work but he was able to resume it in 1916. Since then he has examined 63 appendices of children less than 15 years of age. In this series of new cases the number in which the oxyuris was demonstrated amounted to 76 per cent.

Riff reached the conclusion that the majority of cases of appendicitis are due to parasites and that the oxyuris is the principle agent. Appendicitis is most frequent between the ages of 5 and 20 years, a period which corresponds to that in which the oxyuris is most abundant. Infancy has a relative immunity against oxyuriasis because it is protected against auto-reinfection, the principal cause of the persistence of the disease.

W. A. BRENNAN.

Rulison, E. T., Jr.: Drainage in Appendicitis. *Ann. Surg.*, 1919, lxx, 724.

Most surgeons employ intraperitoneal drainage when the peritoneum shows a definite disappearance of gloss over a considerable area or is covered by a foul fibrinopurulent exudate. The condition of the appendix, if the appendix is removable, is of secondary importance.

If infection has progressed to the stage of intraperitoneal abscess drainage becomes practically imperative.

The advisability of drainage in acute appendicitis with diffuse peritonitis is often questioned. But whether drainage from the general peritoneal cavity continues for an hour after operation or for one or two days, it would seem advisable to afford the peritoneum whatever advantage it may give.

In cases in which there is progressive fibrinopurulent peritonitis the advisability of drainage cannot be questioned.

Closure of the peritoneum and drainage of the tissues of the abdominal wall is a practice which arose as a result of the observation that in certain cases of acute appendicitis with a degree of localized infection that might be controlled safely by the peritoneum the contamination of the wound during operation led to secondary infection. In other words, it is a recognition of the fact that the structures of the abdominal wall are less able to deal with the infecting organisms.

From Jan. 1, 1915, to Dec. 1, 1918, 622 cases of acute appendicitis were admitted to the Presbyterian Hospital in New York City. The intermuscular incision of McBurney was used in 176 cases (67 per cent); the intermuscular incision with extension into the right rectus sheath (Weir) in 43 cases (17 per cent); the right rectus incision through the muscle in 30 cases (11 per cent); the incision through anterior rectus sheath with retraction of the rectus muscle toward the midline (Kammerer) in 2 cases; and the transverse incision (Rockey) in 3 cases. Hernia occurred in 22.3 per cent of the cases in which the intermuscular incision was used, 29 per cent of those in which the rectus was used, and in 30 per cent of those in which the Weir extension was employed.

The type of drain used most frequently was the double-arm tube. This tube is so fashioned that the deep ends of the two arms are held together by a narrow connecting portion of the tube wall. One arm is fenestrated and provided with a gauze wick which affords capillarity between the depth of the tract and the wound dressing. The other arm, which is non-fenestrated and left open, permits the introduction of a catheter for irrigation at the daily dressing.

Fenestrated, thin-walled, soft rubber tubes are considered to combine the highest grade of efficiency in drainage with the least danger of harm to the infected intestinal wall. While the cigarette drain (gauze wrapped with rubber tissue, rubber dam, or gutta-percha) causes less pressure on the contracted intestine, it is quite worthless after a few hours.

The postoperative care of the wound in the Presbyterian Hospital consisted of (1) loosening and gradual shortening of the original drains followed by (2) early or late removal and replacement of these drains by others of the same or smaller size, and (3) irrigation of the wound at the daily dressing with saline or boric solution.

The progress of wound infection and repair under these methods of treatment was strikingly similar.

In a perusal of the dressing notes of many of the cases the author was impressed by the number of manoeuvres which were decidedly painful. When the Carrel-Dakin method is used the patient has complete freedom from painful dressings.

There were 36 cases (14 per cent) in which wound drainage was inefficient. Hæmorrhage from the wound occurred in 7 cases (2.7 per cent). The degree of suppuration was determined in 207 cases. Slight suppuration throughout was recorded in 19 cases (9 per cent), moderate suppuration in 55 (26.5 per cent), and profuse suppuration in 133 (64.5 per cent). In 106 cases there was definite necrosis of the aponeurosis of the external oblique (70 per cent).

Fæcal fistulæ appeared in 18 cases (7.5 per cent of those in which recovery resulted). Among the 24 fatal cases fistulæ developed in 2.

That prolonged tube pressure against an infected intestinal wall causes an area of localized necrosis was clearly demonstrated by the very low incidence of fistula in cases treated by an early substitution of a smaller drain or catheter.

Paralytic and mechanical ileus occurred in 7 cases (2.6 per cent) and mechanical ileus in but 3 cases (1.1 per cent).

Acute dilatation of the stomach developed in 3 cases and was relieved in all by lavage and change of position. Pulmonary complications occurred in 36 (13.7 per cent).

The mortality in the 263 cases was 9.1 per cent. Fifteen of the 24 deaths were directly attributable to the peritoneal infection. Three were due to pulmonary embolism; 1, to embolism of the femoral artery with gangrene of the leg and deep sacral decubitus, and 4 to pyelphlebitis, tuberculous broncho pneumonia, inanition due to high intestinal fistula, and long-continued sepsis resulting from multiple foci (subdiaphragmatic abscess, empyema with fæcal fistula). One patient was readmitted to the hospital seven months later with acute ileus from a band which caused gangrene of a loop of the ileum and died following resection.

"Bulges" or weak walls were noted in 29 cases (18 per cent) and hernia in 33 cases (20 per cent). The anatomical results were poor, therefore, in 38 per cent of the cases.

Operations for the repair of ventral hernia were performed in 8 cases and were successful in 6. The hernia operations were delayed from eight months to a year for two reasons. First, because in several cases of weak walls with decided bulges the bulges disappeared spontaneously as the abdominal musculature improved. Second, because pyogenic organisms probably remain enmeshed in the scar tissue of these wounds for a considerable period of time and lessen the chances for success in hernial repair.

The average period of suppuration was fifteen and four-tenths days. The average duration of the patients' hospital stay was twenty-eight days.

E. H. POOL.

Coffey, R. C.: Closure of Fæcal Fistulæ by Indirection. *J.-Lancet*, 1919, n.s. xxxix, 633.

Owing to the fact that the field is septic, primary closure of a fæcal fistula is not feasible. Therefore the stream of faecal material must be carried off through a channel which may be afterward closed by natural forces while the fistulous tract is being mended.

Two conclusions are drawn as to the surgical principles involved. First, there must be an irresistible tendency on the part of the peritoneum to cling to its abdominal wall. This is effected by intra-abdominal pressure and the power of the sub-peritoneal connective tissue to hold the peritoneum to the muscular wall of the abdomen loosely yet persistently. Second, in abdominal operations in which virulent sepsis is encountered, the wound may be closed in the presence of sepsis by layer sutures and primary union of the rest of the wound may be obtained if there is sufficient drainage through the lower end of the wound. These observations form the basis of the method of treating fistulæ herein described.

1. Dissect out the old scar down to the fat and make an incision around the fistulous tract, including a small strip of skin. This incision should be long, 2 or 3 in. above the fistula and an equal distance below it.

2. Dissect up the fat from the fascia for as much as 2 in. on either side of the incision. Draw it back clear of the fat off the aponeurosis.

3. Make an incision through the aponeurosis, beginning at the upper end of the wound and coming toward the fistula. Dissect the aponeurosis from the muscle for at least 2 in. on either side of the incision.

4. Dissect the muscle from the peritoneum in the same manner.

5. Trim off the small margin of skin which has been left with the edge of the fistula.

6. If the wall of the fistula is hard and cicatricial and therefore difficult to turn in, make an incision part of the way through the cicatricial tissue so that it will turn in easily.

7. Turn in the edges of the fistula with linen sutures. Knot the sutures on the inside.

8. With a second layer of chromic sutures bring the edges of this incision and the connective tissue over the peritoneum along with the scar tissue, covering the turned-in fistula to add temporary strength and bulk to the closure. Mop or irrigate the peritoneum and the rest of the wound to make them as clean as possible.

9. Place silkworm-gut sutures through the skin, fat, fascia, and a portion of the muscle about $\frac{1}{2}$ in. or more from the edge of these layers and leave them untied and sufficient space at each end of the wound for drainage.

10. Suture the muscle loosely with continuous catgut.

11. Suture the aponeurosis with strong double catgut.

12. Suture the skin with a horsehair buttonhole stitch.

13. Place drains at each end of the wound. These drains should be made of double rubber tubing and extend to the peritoneum. Lay a roll of gauze along the wound and tie silkworm-gut sutures over it.

These sutures should be allowed to remain about two weeks before the horsehair and silkworm gut are removed. In the meantime material which may have come from the fistula will have been carried beneath the peritoneum and delivered to the surface through the opening at the point of drainage. At the same time a substantial granulation wall will have formed around these tubes, leaving a sinus through which any further drainage may take place.

The method described is invariably successful, whether the fistula comes from the large or the small intestine, provided it is located at a point where the layers of the abdomen may be dissected entirely apart and there is no obstruction below.

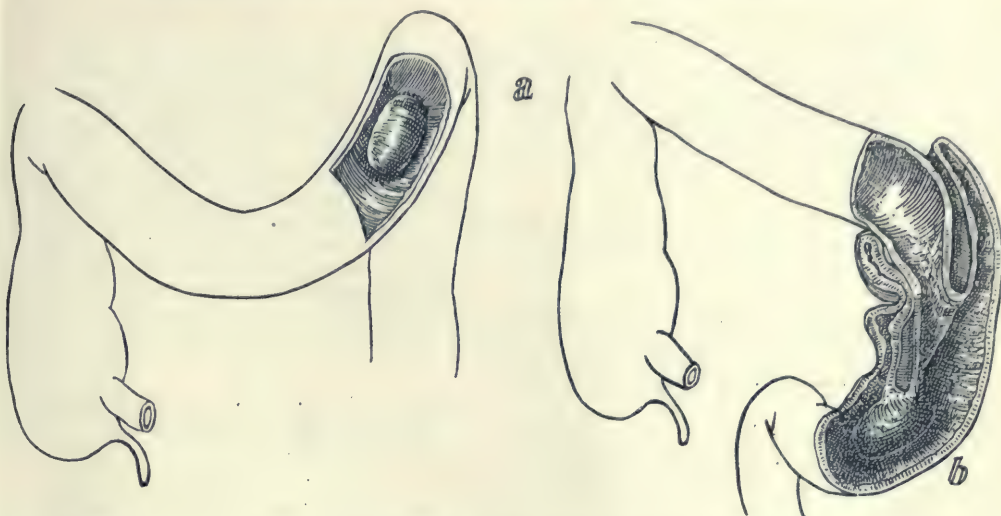
I. W. BACH.

Peet, M. M.: The Problem of Nutrition and a Satisfactory Method of Feeding in High Intestinal Fistulæ. *Am. J. M. Sc.*, 1919, clviii, 839.

The problem of nutrition in cases of high intestinal fistulæ is serious. The loss of fluids and products of digestion steadily lowers the patient's resistance to infection and so weakens him that operative interference becomes extremely hazardous. The administration of small amounts of food by mouth does not materially improve the condition, and mechanical measures to conduct the fluids from the upper to the lower intestinal loop or to occlude the fistulous tract are successful in only a very small number of cases. Rectal alimentation has many limitations; a sufficient number of calories are not absorbed and the time the colon will tolerate nutrient enemata is short.

A successful method is the enteric administration of foodstuffs through a small, soft catheter inserted by way of the fistula into the efferent loop. By this method the number of calories utilized is sufficient to maintain good physical condition and to build up an emaciated patient so that he can withstand the necessary operative treatment. The tube should be inserted at least 3 or 4 in. If inserted 5 or 6 in. the tendency of the fluid introduced to flow back around it becomes practically negligible.

The food introduced must be fluid. The administration of 3 or 4 oz. every hour during the day and at two or three-hour periods during the night will be found to be very satisfactory. Larger quantities are more apt to cause irritation and possibly reversed peristalsis. The fluid can be given readily also by the Murphy drip. Whatever method is used, however, the administration should be slow and the fluid allowed to flow in by gravity. A height of 6 in. is usually sufficient to overcome the intra-abdominal pressure. The tube may be inserted at each feeding or left *in situ*.



A, Original site of tumor. B, Invagination of the intestine; intussusceptum headed by the tumor.

Bevan, A. D.: *Fibroma of the Large Intestine.*

Unlike rectal alimentation, enteric feeding in intestinal fistula is not confined to very simple products. Whole milk may be given freely, but should be peptonized. Raw eggs are tolerated, but it seems best to digest them partially. Beef juice, especially that obtained from thoroughly crushed meat forced through a strainer, is of value as a large amount of protein is furnished by the muscle cells pressed out and the juice, being free from connective tissue, passes readily through the catheter. Glucose in 5 per cent solution should always be added.

E. H. POOL.

Bevan, A. D.: Fibroma of the Large Intestine.
Surg. Clin. Chicago, 1919, iii, 1333.

The case is presented of a man 34 years of age who for a period of a year had had hæmorrhages from the bowel. The bleeding was evidently from the large bowel, but it was impossible to make a clinical diagnosis. Recently a mass had become palpable in the left lower quadrant of the abdomen. An exploratory operation was decided upon. The left muscle-splitting incision having been made and the colon having been brought up, a mass the size of an egg was felt in the bowel. The bowel was incised and the mass, which proved to be a necrotic fibroma, was peeled out. The mucous membrane was then closed over the denuded area of the bowel and the incision in the bowel closed with three layers of sutures. An invagination of the large intestine produced by the tumor was reduced. For safety, the portion of the bowel which was opened was sutured to the external incision. A colon infection of the wound followed but quickly responded to treatment. Recovery resulted without postoperative hernia.

I. E. BISHKOW.

Hamilton, E. P.: Physiopathology of Intestinal Obstruction. *J. Missouri State M. Ass.*, 1919, xvi, 402.

As a result of all the experimental work in this field there seem to be three theories regarding the cause of death in intestinal obstruction.

1. The theory of a nervous reflex which assigns the collapse and death to an irritation of nerve filaments in the intestinal wall.

2. The theory of infection by direct passage of organisms through the wall of the obstructed loop into the peritoneal cavity, the blood stream or the lymphatics.

3. The theory of auto-intoxication which attributes death to the absorption of some toxic substance produced in the contents of the obstructed loop. This substance or toxin is thought by some investigators to be the result of bacterial activity, and by others the result of a disturbance in the normal secretion of the intestinal mucosa.

The weight of evidence seems to favor the last theory mentioned.

From his study the author concludes that:

1. The pathology of intestinal obstruction in dogs shows dilatation of the gut above the obstruction with œdema and redness particularly of the mucosa of the duodenum and upper jejunum. If there is sufficient interference with the circulation there may be gangrene.

2. The kidneys, liver, pancreas, and sometimes the spleen show the typical pathology of severe toxæmia.

3. Toxins producing death in uncomplicated intestinal obstruction originate within the mucosa of the obstruction. Bacterial activity and its end-products are contributing factors.

4. In uncomplicated intestinal obstruction the life of these animals may be prolonged by giving normal salt solution in excess of the amount of liquid vomited and urine secreted which usually amounts to one-tenth the body weight.

5. The longer the obstruction persists the more serious the pathology produced and the graver the prognosis.

LIVER, GALL-BLADDER, PANCREAS, AND SPLEEN

Colonna, G.: The Etiology and Rational Surgical Treatment of Liver Ptosis (Sulla eziologia delle ptosi epatiche, loro cura razionale chirurgica). *Gior. d. r. Accad. di med. di Torino*, 1919, lxxxi, 341.

Colonna's investigation of liver ptosis is based on studies made on cadavers and a detailed study of the causes and physiopathology of the condition.

In cases of liver ptosis the relaxation of the abdominal wall is generally such that even a median laparotomy incision gives a full view of the liver and permits the necessary manipulations for shortening the coronary ligament and suturing the anterior edge of the liver to the abdominal wall.

Colonna therefore makes a laparotomy incision from the ensiform to the symphysis pubis. The portion of the liver most often affected by ptosis is the right lobe. Marked elongation of the right coronary and suspensory ligaments will be found and loose adhesions to intestinal loops. Having separated the liver from these adhesions, the author shortens the right coronary ligament by doubling it, draws up and sutures the sheath of the umbilical vein and the lower end of the suspensory ligament into the upper angle of the laparotomy incision, and secures the anterior border of the liver to the thoraco-abdominal wall by suturing and partial transfixion.

Colonna believes that present-day methods of hepatopepy are inadequate and that a rational treatment of ptosis should include doubling of the coronary ligament, especially on the right side, a Depage suspensory ligamentopexy, marginal fixation of parts not supported by even the shortened ligaments, and a plastic operation to restrict the abdominal cavity and thereby increase the visceral resistance against the lower surface of the liver.

To strengthen the abdominal wall all excessive cellulose-adipose tissue should be excised from the linea alba to the inner edge of the recti muscles, the fibrous elements in this region being preserved.

The author proceeds with this excision in the umbilical region after fixation of the viscera. He opens the sheath of the recti at the anterior edges. In the posterior part of the sheaths the inner edges are isolated for the entire length of the wound and drawn inward and forward to the linea alba. At the same time the posterior part opposite the posterior surface of the recti and behind the preperitoneal fat is detached in such a way that two strips are formed, one on the right side and one on the left, each about

5 or 6 cm. wide. These are then sutured at their base. The two strips which are thus overlapped and project across the linea alba are turned back on the left where they are fixed with a suture and act as a tendinous re-inforcement of the abdominal wall.

The skin and cellulose-adipose tissue from the anterior surface of the two recti to their external edges and extending their entire length are dissected through the laparotomy incision. One of the recti is placed beneath the other and the two muscles united by the anterior part of their sheath are fixed to each other by suture for the greatest extent possible. The wound is then closed.

W. A. BRENNAN.

Erdmann, J. F.: The Incidence of Malignancy in Diseases of the Gall-Bladder. *Am. J. Obst.*, 1919, lxxx, 618.

The frequency of malignancy in diseases of the gall-bladder is presented by the author with an analysis of statistics based on private and institutional practice.

Formerly 4.5 per cent was the accepted figure for malignancy in the gall-bladder, but the frequent occurrence of the condition recently observed leads the author to doubt this percentage. In a period of six weeks 6 cases of malignancy were found in 30 cases of suspected cholecystitis, and in a following period of eight weeks 3 more were discovered in 45 cases.

In the past two years 1,903 cases were operated upon, and in 224 the operation was done for cholecystitis. Malignancy was found in 15 of the latter (6.7 per cent). In addition, there were 13 cases of general abdominal carcinomatosis in which the point of greatest involvement was in the neighborhood of the gall-bladder. As in the whole series, malignant growths of all kinds, excluding lip epitheliomata, were found 285 times, their occurrence in the gall-bladder amounted to 6 per cent.

The ages of the patients varied from 42 to 67. All were females. Malignancy of the duct, papilla, and pancreas occurs more frequently in males.

A review of the mortality due to malignancy in 1918 in New York City shows that of 2,170 deaths, 192 (10 per cent) were due to malignancy of the gall-bladder and liver, and that 97 of the 192 deaths were those of women. Unfortunately no distinction was made between gall-bladder and liver conditions. The fourth, fifth, sixth, and seventh decades were the chief ages in which the condition was observed.

As to the frequency of cancer of the biliary system the author states that it occurs first in the gall-bladder, cystic duct, and liver; second, in the pancreas and common duct; third, in the common and hepatic ducts; and fourth, in the papilla of Vater.

As stones were found in the gall-bladder in all of the cases observed, early elimination of such agents is therefore of utmost importance. Today the operative mortality of cholecystostomy and chole-

cystectomy is from 2 to 3 per cent while that of malignancy is from 5 to 6 per cent.

There are no definite symptoms of early malignancy other than cholecystitis but it should be suspected when there is a palpable mass in the right hypochondrium in non-acute cases, with or without a deepening jaundice. Ever-deepening jaundice, slow in onset, is in itself a strong sign of malignancy. Loss of weight is evident only when the common duct, pancreas, or adjacent viscera are involved. Pain is usually a sign of inoperability.

Unless a complete cholecystectomy is done, death follows operative interference rapidly if the growth is established in the cystic fissure or suspicious metastases are present. Occasionally, however, in certain involvements of the fundus and body a satisfactory excision may be done. Excision of sections of the ducts should be studied further. The high mortality forbids resection of the head of the pancreas.

Involvement of the ampulla and papilla is best overcome by a cystogastrostomy, and if the duodenum is obstructed, a gastro-enterostomy should be added. The case is reported of an 18-year-old boy, who lived twenty-two months following these procedures.

The conclusion to be drawn from the statistics is that an established diagnosis of cholecystitis indicates the possibility of cancer and that the mortality of malignancy is almost double that of operation.

P. M. CHASE.

Babcock, R. H.: The Diagnosis of Chronic Cholecystitis Complicating Cardiac Lesions. *J. Am. M. Ass.*, 1919, lxxiii, 1929.

The author discusses the relation of chronic cholecystitis to cardiac lesions and reports three illustrative cases.

Often the gastric disturbances which accompany a known cardiac lesion are attributed to passive hepatic congestion and venous stasis of the upper digestive tract, whereas the underlying cause is in reality a definite cholecystitis.

The history is rarely of value in the diagnosis, but a history of typhoid or rheumatism is often suggestive. If the digestive symptoms are more pronounced than the respiratory, or if palpitation occurs at night and without exercise or is accompanied by epigastric distress, attention should be directed toward the appendix and the gall-bladder. Nausea, vomiting, and jaundice need not necessarily be pronounced.

In passive congestion of the liver in a cardiopathy the left as well as the right lobe is palpable and the notch between the two can be detected. Signs of venous stasis are present also in other organs and tissues. In cholecystitis there is downward enlargement of Riedel's lobe alone in varying degrees, and the right rectus is usually spastic. In many cases the tender distended gall-bladder may be palpated on deep inspiration. To avoid contraction of the rectus muscle gentleness of manipulation is of

the greatest importance in the physical examination of this region. Ewald's area of cutaneous hyperæsthesia in the right lower back is present invariably and when found corroborates the diagnosis. The temperature and the leucocyte count vary with the intensity of the infection in the gall-bladder.

P. M. CHASE.

Richter, H. M., and Buchbinder, J. R.: The Omission of Drainage in Common-Duct Surgery. *J. Am. M. Ass.*, 1919, lxxiii, 1750.

Too little attention has been devoted to the possibility of a cleaner and safer technique in common-duct surgery, namely, the tight closure of the duct following exploration and closure of the abdominal incision without the use of drainage material of any type. Most theses on the surgery of the biliary tract emphasize two points essential to a safe outcome: (1) that the common duct itself should be well drained by a tube placed either within it or to it, and (2) that the abdomen should be drained down to the line of suture. It has been pointed out that the infected ducts should be drained as infection elsewhere is drained, and that closure of the common duct is not without the danger of leakage of infected bile.

The common duct, lined with mucous membrane, is a suitable drainage tube in itself and an ideal medium by which the affected parts above may be drained. If its patency is assured, it may be opened and sutured with impunity.

The use of the silver probe or sound is an unreliable method of determining the patency of the duct. A scoop or curette is much more satisfactory and should be passed through the duct to the duodenum.

The patency of the duct having been demonstrated, the common duct should be carefully sutured with the finest needles and suture material obtainable. Capillary leakage through the line of the suture must be a constant accompaniment of the use of the ordinary suture materials. The conditions most to be desired are obtained with the use of human hair and the finest cambric or bead needles. The immediate strength of the line of suture is greater than when a heavier suture is used, and there is no capillary leakage along the needle perforations.

The authors use two layers of such sutures, one uniting the free edges, the other burying the first row. An essential part in the suturing is to include the peritoneal coat. As in the case of a sutured bowel, no drain of any kind is placed in contact with the suture line.

Closure of the duct in this manner, avoiding the use of any foreign body for drainage material, is associated with a minimum of peritoneal traumatism, and the soiling by infected bile that may occur during the exploration causes practically no postoperative clinical reaction. In the absence of drainage, postoperative adhesions are reduced to a minimum.

H. A. MCKNIGHT.

MISCELLANEOUS

Stewart, W. H., and Stein, A.: The Roentgen-Ray Study of the Abdominal Organs Following Oxygen Inflation of the Peritoneal Cavity. *Am. J. Roentgenol.*, 1919, vi, 533.

The history of the study of the abdominal viscera by the aid of intraperitoneal injection of oxygen or air is given very fully. Kelling is credited with being the first to use this method on human beings (1902). Beside Kelling's work, that of Jacobaeus of Stockholm in 1910 and 1911, of Weber in 1912, of Meyer-Betz in 1914, and of Goetze in 1918 is reviewed at length.

The authors' attention was directed to the subject following their attempt to locate the position of a foreign body in reference to the diaphragm and liver. They have examined thirty-seven cases in all by the intraperitoneal injection of oxygen and have

found it possible in this way to study in detail the outline of the liver, the spleen with its pedicle, both kidneys, and the uterine appendages. Adhesions, enlarged peritoneal glands, and other types of pathology are always graphically demonstrated.

The technique as described by the authors consists simply in permitting the oxygen to flow from an oxygen container through an ordinary spinal puncture needle, local anæsthesia being used at the point of puncture. The oxygen is allowed to flow into the cavity until the abdominal wall is dome-shaped. Plates are then made with the patient in various positions. Usually the side on which the organ to be examined is located is placed opposite the plate as the air in the abdominal cavity tends to rise to the highest point.

The only dangers incident to the method are infection and puncturing of the intestines, but neither will occur if care is taken.

W. A. EVANS.

SURGERY OF THE EXTREMITIES

DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Bowman, W. B.: Coccidioidal Granuloma. *Am. J. Roentgenol.*, 1919, vi, 547.

Coccidioidal granuloma is a definite acute, sub-acute, or chronic disease due to an infection by a parasitic organism or mould-like growth called by Ophüls the "oidium coccidioides".

Practically all of the cases thus far reported have occurred in California and in the San Joaquin Valley of that state, but it is the author's opinion that the disease is more widespread than the reports indicate. The lack of reports from other localities he believes is to be explained on the basis of inaccurate diagnosis.

The pathologic processes of the disease, both microscopic and macroscopic, resemble those of tuberculosis, and it is possible that this infection is reported as tuberculosis. Therefore, the author suggests that in all cases which clinically resemble tuberculosis and in which the tubercle bacillus is not demonstrated an examination should be made for oidium coccidioides. The organism is a spherical body varying from 7 to 30 microns in diameter.

Six cases are reported in detail with the clinical history, the pathology, and the postmortem findings. The bone changes are those of extensive destruction with the formation of nodules resembling tubercles and large giant-cell formations of the Langham type. The infection tends to spread along the tendons and muscle sheaths to a considerable distance from the joint and the process is more acute than in tuberculosis.

In the lungs, œsophagus, heart, and other soft tissues are found nodules of varying size. Some of them show caseous centers. The roentgen examination reveals destruction of bone, which in some cases

is associated with periosteal proliferation. There is also bone atrophy but this is not so general or so marked as that observed in tuberculosis.

No successful method of treatment has been discovered. In one case, in which the infection was detected in the arm, there was no recurrence after amputation at the shoulder.

W. A. EVANS.

Coley, W. B.: Further Observations on the Conservative Treatment of Sarcoma of the Long bones. *Ann. Surg.*, 1919, lxx, 633.

The author presents a report of the cases of sarcoma of the long bones which have come under his care in the last five years (60 in number) and gives a résumé of 190 previously reported.

These cases furnish further evidence in favor of the conservative treatment of sarcoma of the long bones by mixed toxins of erysipelas and bacillus prodigiosus and radium.

As a diagnostic measure and to facilitate the application of radium Coley resorts frequently to exploratory operation. Too much reliance must not be placed upon a single microscopic examination of the tissue as the clinical and X-ray pictures and the gross appearance are often of greater value. This is especially true as regards the so-called giant-cell sarcoma, giant-cell tumor, and osteitis fibrotica. The author had 40 of these tumors in his series and discusses them at length. He emphasizes the fact that pain, especially deep boring pain, may be the earliest symptom of the disease and precede the development of the tumor by weeks or months.

The 60 sarcomata treated by Coley during the last five years involved the following bones: femur, 32; humerus, 14; tibia, 9; fibula, 3; clavicle, 2.

Of the 32 femur cases, amputation was performed in 13 after conservative treatment had failed. There was no mortality from the operation. In 4 cases

amputation was strongly advised but was refused by the patient. Eleven of these patients are still living. Two are recent cases still under treatment with a reasonable prospect that the limb will be saved. One of the patients who refused amputation had a large central sarcoma of the lower end of the femur. Treatment with toxins and radium resulted in slight temporary improvement but metastases later developed in the lungs and death occurred in a few weeks. In one case of periosteal sarcoma the administration of toxins was followed by amputation. When recurrence developed this patient had been well for three years. One patient with a central sarcoma of the lower end of the femur and extensive involvement of the knee joint refused amputation and recovered following the toxin treatment alone, remaining well for five years. Another who refused operation had an extensive sarcoma of the lower end of the femur involving the knee joint and the upper end of the tibia. The use of toxins supplemented by radium resulted in recovery. The patient has been well for three years and is able to walk without support of any kind. In one case of a very large inoperable sarcoma of the upper half of the femur quite beyond hip-joint amputation, recovery occurred following treatment with radium and toxins and continues without any evidence of the disease two years later. In 2 cases of periosteal sarcoma of the femur treated with radium and toxins during the last six months in the hope of saving the limb the result is still doubtful. In 3 cases of sarcoma of the femur amputation was followed by the use of mixed toxins as a prophylactic against recurrence. Two of the patients are still well three years later. The third died of metastasis nearly three years after amputation.

K. L. VEHE.

Tubby, A. H.: Congenital Dislocation of the Hip: Note on a Method of Dealing with Refractory Cases. *Lancet*, 1919, cxvii, 1135.

The author believes that the iliopsoas muscle is of great importance in the formation of the hour-glass capsule and the obliteration of the acetabulum in congenital dislocations of the hip in children over 4 years of age. The capsule becomes constricted in the center, the anterior wall is infolded backward and inward, and the iliopsoas acts as a suspensory ligament. In late cases the anterior layer blends with the floor of the acetabulum, forming a wall, and thus obliterates the cavity and prevents reduction of the dislocation.

Tubby has successfully treated patients varying in age from 1 up to 15 years by an operation which he describes as follows:

The capsule is exposed through an incision between the sartorius and tensor vaginae femoris and is opened by a crucial incision over the head of the femur. The constriction being next exposed and the tight iliopsoas muscle defined, they are then divided, when it will be found that the femoral head is easily reduced. After the reduction the capsule is sutured and the limb put up in full abduction.

Open operation is not urged until manipulative measures have failed. In obstinate cases the quadratus femoris should be sectioned in addition to the iliopsoas and the capsular diaphragm. In cases of anteversion, subtrochanteric osteotomy should follow reduction by the operation described. The fragments should be plated and the limb put in plaster at an angle of 90°. H. W. MEYERDING.

Smith, M. T.: Injuries of the Knee Joint. *North-west Med.*, 1919, xviii, 263.

In listing industrial knee-joint injuries the author gives first place to lateral sprains. Usually occurring in the internal ligament, the trauma is due to a twist of the flexed leg on the thigh so easily obtained in the stooping position of the miner. Such an injury is followed by joint effusion and local tenderness necessitating treatment by rest in bed and immobilization followed by pressure bandaging and tilting of the sole of the heel.

Injury to the semilunar cartilage, always the inner, is usually associated with injury to the internal lateral ligament and follows extension of the rotated leg on the thigh. The same etiology allows the internal condyle of the femur to impinge on the cartilage, either dislocating or crushing it. In such cases there is severe pain with inability to extend the knee completely or complete locking plus negative X-ray findings, joint effusion, and tenderness. The treatment of the first attack is complete flexion of the leg on the thigh with internal rotation of the foot and quick extension, followed by rest in bed and immobilization for two or three weeks. If this injury occurs many times, removal of the cartilage is indicated. The author recommends Sir Robert Jones' method according to which a short incision is made directly over the cartilage.

Loose bodies seen in seven cases and causing intermittent locking were due to direct trauma. The treatment of these is removal. Rupture of the crucial ligament is the most serious associated lesion in dislocation of the knee, but immobilization results in a firm cicatrization of the ligaments and often a useful joint.

The conclusions drawn are as follows:

Miners are especially prone to injuries of the internal lateral ligament and the internal semilunar cartilage. Internal derangements, though serious, may present only effusion. In cases of recurrent locking removal of the injured semilunar cartilage is the procedure of choice and restores function.

R. G. PACKARD.

FRACTURES AND DISLOCATIONS

Ryerson, E. W.: Intramedullary Beef-Bone Splints in Fractures of Long Bones. *J. Am. M. Ass.*, 1919, lxxiii, 1348.

The intramedullary beef-bone splint is easy to apply and affords great strength. The proper alignment of many fractures, especially those of the forearm, is difficult to attain. While the short

medullary splint gives apposition, it does not prevent angulation. The long splint is often difficult to insert on account of muscular contraction. Ryerson describes a method of applying the long intra-medullary splint.

Beef tibia or femur about 5 or 6 in. long is made into strips $\frac{3}{4}$ in. in diameter for the adult femur and $\frac{3}{8}$ in. in diameter for the humerus. A variety of approximate sizes should be on hand, however.

A hole is bored near one end like a needle eye. The fracture is exposed in the usual way. The splint is driven into the medulla of the long fragment, eyeless end first, and the eye is threaded with catgut. A hole is then drilled obliquely through the cortex into the medulla of the short fragment. This hole slants toward the break and is placed at a distance of one-half the splint-length from the fracture. Through it wire is threaded, brought out at the end, and fastened to the catgut which has been previously attached to the hole in the splint. The fracture is then reduced and by means of traction on the wire and catgut the splint is drawn into position. To keep the splint from slipping the catgut may be sewed to the periosteum.

The method is not adapted to comminuted fractures. Transverse fractures are the most satisfactory types for the procedure. K. L. VEHE.

Bonneau, R.: Correction of Osseous Deviations in Fractures of the Long Bones by Direct Action upon the Free Extremities of the Fragments (Correction des déviations osseuses dans les fractures des os longues par action directe sur l'extrémité libre de fragments). *J. de chir.*, Par. 1919, xv, 371.

Bonneau deals especially with the deviations in alignment of the femur following fractures.

The most efficacious method of correcting such deviations is correction by direct action on the free ends of the fragments. This anatomical correction may be obtained in two ways: (1) by osteosynthesis, and (2) by the application of plaster. Of the two methods the second causes the least traumatism on the periosteum and bone. A Lambotte or Lane bone plate gives rise to foci of osteitis in the bone which retard the formation of callus and often produce small sequestra requiring months to destroy.

Bonneau's method consists of wire osteosynthesis with wire fixation of the fragments in proper alignment. The wire is passed through a hole bored in each fragment and twisted until the fragments are in correct approximation. It is then bound round the fragments and brought to the exterior of the wound where it is attached to the metallic bone splint. A screw arrangement fixed to the splint conveys such pressure to the fragments as may be necessary to make the correction exact. Both this long screw and the wire act as drains and their ultimate removal does not necessitate reopening of the wound which must be done when a plate is used.

The author states that after having been a very ardent partisan of osteosynthesis he now employs

this external method of fixing the fragments together exclusively. W. A. BRENNAN.

Bompiani, R.: The Treatment of Open Gunshot Fractures and Articular Wounds (Riassunto critico sulla cura delle fratture aperte e lesioni articolari d'arma da fuoco). *Polislin.*, Roma, 1919, xxvi, sez. chir., 249; 297; 336.

The author reviews the results obtained in the treatment of more than 1,000 cases of osteo-articular war injuries. In 729 cases the patient recovered; in 519 there was no infection; in 210 the wound became suppurative; and in 207 such complications as gangrene, shock, tetanus, etc. developed.

Operation was performed in 829 cases and primary suture was done in 103. A destructive operation was necessary in 81 and a second operation in 138 cases. These secondary operations were principally sequestrotomies, resections of amputation stumps and operations for pseudarthroses or ligation of vessels because of secondary hæmorrhage.

There were 87 deaths in the whole series, 22 occurring in amputation cases and 36 due to primary shock and anæmia.

The author attributes the large percentage of the cases in which there was no infection to the systematic surgical prophylaxis which was followed.

In 103 cases in which primary suture was done there were only 5 failures. In 3 of these suture was done a second time, and in 2 recovery followed suppuration. The proportion of cases running a suppurative course compared with those evolving aseptically was much higher in the author's early series than after primary suture was adopted.

The author believes also that surgical treatment wards off complications. The mortality in the cases of shock and acute anæmia was unusually high because the patients were not received until they were already in a dying condition. The cases of gas gangrene (5 per cent of the total) are certainly not many and the general mortality, 1.9 per cent, is lower than the mortality given by other authors. The fact that there were only 6 fatalities from septicæmia out of a total of 29 cases proves the worth of surgical prophylaxis.

The author directs attention to the value and importance of serum treatment in cases of tetanus. In the 3 cases in which death was due to this cause the use of serum had been omitted or limited to a single injection.

The results obtained in articular injuries were very satisfactory. Out of a total of 143 knee-joint wounds, which are usually considered the most grave, there were about 50 primary recoveries. In a total of 159 cases of other joint injuries there were about 70 primary recoveries. W. A. BRENNAN.

Cotton, F. J.: Adequate Reduction and Care in Colles' Fracture. *Boston M. & S. J.*, 1919, clxxxi, 651.

In this paper Cotton champions the flexion method of reducing Colles' fracture, but adds also a new

twist — pronation. He states that if the ulna is the fixed point about which the wrist is displaced backward, it should be the fixed point around which the displacement is reduced. Strong pressure is made anterior to the head of the ulna, and the wrist is flexed and pronated in "one sweeping twist" by a strong drag. To hold it there, plaster splints molded over the anterior and posterior sides are used, the fingers, of course, being left free. This flexed position is maintained for two weeks, after which straight splints are applied for a week longer. Massage and exercises are then indicated.

Several complications which may result in disability are described. In a few cases traumatic arthritis may develop. The patient improves very slowly, but usually recovers perfectly under prolonged treatment with heat, massage, and passive motion. Anterior luxation of the ulna is rather common, and when associated with shortening of the radius may result in a locking anterior to the pisiform which prevents flexion. Following tearing of the ligaments there may be a recurrent luxation of the ulna. All these conditions may be corrected by osteotomy even long after the injury. The ulna trouble can never be corrected unless the radius is made straight as the two bones are held together above the point of fracture by the interosseous membrane. Therefore, to relieve the symptoms which are mostly on the ulnar side more care must be exerted in reducing the radius. W. A. CLARK.

Fassett, F. J.: The Standard British Method of Treating Fractures of the Femur at the Close of the War. *Northwest Med.*, 1919, xviii, 253.

Three outstanding ideas in the treatment of femoral fracture resulted from the studies made during the war: first, the use of the Thomas knee-splint in its varying forms for first aid, transportation, and throughout treatment; second, the suspension of the splint so as to permit raising and tilting of the lower fragment to meet the upper fragment at the proper angle; and third, other methods of traction than adhesive plaster skin-traction, particularly the use of Sinclair glue, calipers into the condyles or malleoli, screws in the shaft of the tibia, and stirrups inserted above the os calcis anterior to the tendo achillis.

In 1918 a general plan of instruction as to the best all-around system for the management of serious fractures encouraged the following general routine:

The beds were supplied with mattresses made in removable sections to permit easier access to the wound. The pulley was placed at the foot of the bed 3 ft. above the level of the mattress. The Thomas splint used allowed flexion of the knee. The thigh and leg were supported by transverse flannel slings which could be adjusted. The foot-piece of the splint was made fast to the upright at the foot of the bed to bring the lower femoral fragment in line with the upper fragment. Traction was made by means of tongs inserted into the condyles of the bone. To insert these tongs, the skin was first

cleaned and drawn upward before the bone was incised. The tongs were then inserted and pressed firmly into place. Traction was applied by a rope fastened to the handles. This insertion could be done under local or general anæsthesia as preferred. The mere presence of infection did not indicate the removal of the tongs though it would have necessitated the removal of Steinmann nails extending through the marrow cavity. As landmarks for the insertion of the tongs, the inner blade was placed just above the adductor tubercle, and the outer blade just opposite. Care was taken to prevent relaxation on the handles, and the tongs were left in place until union was at least under way.

The author concludes that the three main factors in this treatment were the Thomas splint, the suspension of the splint, and the direct traction to the bone instead of to the skin. R. G. PACKARD.

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Arquellada, A. M.: My Experience in the Treatment of Osteomyelitis (Mi experiencia en el tratamiento de las osteomielitis). *Pediatría española*, 1919, viii, 399.

Arquellada reports the results of his treatment of osteomyelitis in cases in which the infection complicated or followed influenza.

His statistics cover 167 cases; 99 of the tibia, 26 of the femur, 11 of the humerus, and the remainder of various other bones. Perfect healing was obtained in all but one case. This patient suffered a fracture of the upper end of the tibia during the period of reorganization and was left with an ankylosis of the knee.

The author used both surgical and vaccine therapy. He removed the sequestra by surgery and employed vaccine after the wound was opened to prevent secondary infection.

Several surgical procedures are described. The first consists in opening the bone cavity, removing all sequestra, cleaning the cavity thoroughly, and then filling it with gauze. A second process consists in cleaning out the osteomyelitic focus, making it as aseptic as possible, filling the cavity with Moe-setig's paste, and suturing the skin over the paste. In a third method the cavity after being cleaned out is filled with some organic substance.

Arquellada considers the first method the poorest of all because it retards healing, exposes the wound to postoperative infection, and is excessively painful. Unfortunately, in about half the cases it is the only possible procedure. He recommends, however, that autovaccine be used in connection with this method. Lately he has used Dakin's solution in these cases, applying it several times daily until the microscopic examination of the exudate shows the absence of pathogenic organisms. Then he closes the wound. It is only fair to the Spanish to mention in this connection that the idea of using hypochlorite solution for the cure of wounds origin-

ated with Cortezo who employed it for the first time in 1884.

If the cavity is to be filled with paste it must be cleaned thoroughly and made perfectly aseptic. Arquellada uses a stream of hot air for this purpose. Great care must be taken that the suture includes the separated periosteum. It is so important that the periosteum be sutured that if it is not included with the other tissue it must be sutured separately. In some of the cases in which paste was used the wound was completely healed over the paste in twenty days; in others the paste was discharged later without causing the patient any trouble; in still others the suture broke and the paste was discharged painlessly, little by little. This procedure is contra-indicated if the skin is macerated or destroyed.

In the method by which the wound is filled with organic material, fatty or other tissue from the vicinity of the wound may be used. Fatty tissue may be brought from the gluteal region, or a lipoma, if present, may be utilized. Arquellada has had no opportunity to use lipomata, but he has used fatty tissue from the gluteal region a number of times. In one instance the cure was total but in the other two instances the tissue was gradually discharged. The time required for healing in these cases was shorter than the average for the cases that were treated with the paste. The use of fatty, muscular, and subcutaneous tissue from the neighborhood of the wound and the process of using periosteum only to fill the cavity are also described.

Arquellada sums up his article as follows:

1. Vaccine therapy ought to be employed at the beginning of the disease.
2. The best operative method is to fill the cavity with organic material from the vicinity of the wound.
3. Next in order of good results is the filling of the cavity with paste.
4. When the wound does not close by first intention Dakin's solution and later suture may be used.
5. If the cavity remains open, an autovaccine should be used.
6. If the bone is not completely regenerated, bone transplanting should be done. W. A. BRENNAN.

Kirmisson, E.: Twenty Years' Experience with the Results of Resection (Les résultats des résections d'après une observation de vingt années). *Rev. d'orthop.*, 1919, n.s. vi, 485.

The data presented by the author were obtained from 201 resections as follows: knee, 118 cases; hip, 42 cases; elbow, 19 cases; tarsals, 20 cases; and wrist, 2 cases.

The majority of the patients were seen again at a more or less long interval after the resection was done and therefore when there were definite results. From these cases Kirmisson concludes that when the technique used is correct and the indications are well judged resection will give excellent results.

Generally adolescence and maturity are the most favorable times for resection. In children, especially when the operation is done before the fifth year of age, and in old persons the results are often very poor. It was under such circumstances that the author frequently observed deformities and marked shortening following resections of the hip.

In the hip, deformity is seen as inversion of the limb characterized by flexion and abduction, and in many cases it causes luxation of the upper extremity of the femur in the external iliac fossa. Especially in resections of the knee, deformities are of great importance owing to their frequency and their consequences. They are produced usually in the form of flexion and genuvarum. Genuvalgum is more unusual.

While resection would be ideal for curing chronic arthritis if it preserved movement, it must be confessed that this result is not yet quite realizable. Moreover, the preservation of movements may itself be a danger either from the point of view of recurrence or from that of deformity. Here the serious question as to the condition of the muscles intervenes. It is well to preserve the mobility of the joint but only if the muscles that enable it to function are preserved. It is of little use for a patient to have a mobile hip joint if owing to atrophy of the necessary muscles he is unable to extend the leg. In such cases solid ankylosis would be preferable.

In his clinical examinations Kirmisson had the opportunity to compare the walking of two patients one of whom had a solid ankylosis of the hip while the other had had a resection of the joint. The patient with ankylosis walked solidly while the patient whose hip had been resected hesitated at every step like a person with congenital luxation of the hip. The condition of the musculature, therefore, is one of the principal factors to be taken into account.

Of 26 patients who had a knee resection before their fifth year of age 18 had a deformity in later life. Of 22 patients who had a knee resection between their fifth and tenth years of age 16 had a subsequent deformity.

There were 9 cases of resection of the hip before the fifth year of age and 23 between the fifth and fifteenth years. In the first group a deformity or great shortening resulted in nearly all. In the second group satisfactory results were obtained in only 2 cases. W. A. BRENNAN.

Starr, C. L.: A Consideration of Some of the Problems Presented by Amputation. *J. Am. M. Ass.*, 1919, lxxiii, 1585.

An ideal stump is defined as a stump the length of which will best permit the instrument maker to fit the most suitable appliances to the portion of the limb amputated. It should have a linear scar free from puckering or infolding of the skin, and sufficient flap to cover the end of the bone readily but without redundancy. It should have also a pad of fat and subcutaneous tissue over the bone end which should not be adherent. The joints above the amputation should have full range of motion.

Some of the surgical problems which are encountered are:

1. Latent infection which may be lighted up very easily. In some instances massage and manipulation of the stump may be sufficient to start afresh a cellulitis which may become very troublesome.
2. Ulcers still remaining which may require excision.
3. Sinuses. These are usually due to the presence of either a foreign body or non-collapsible wall of fibrous tissue, and on removal of the cause will invariably heal promptly.
4. Spurs of bone or exostoses. These are of frequent occurrence and due to a tearing up and partial detachment of shreds of periosteum or small bone fragments broken off by the saw.
5. Fibroneuromata. Fibroneuromata are found not infrequently growing out from the cut end of the nerve. The complication may be obviated by cutting the nerve obliquely or at a higher level after stripping back the sheath, and then tying the sheath over the cut end.

Edema of the stump is treated most efficiently by suitable pressure with a bandage and the use of a temporary peg leg with a plaster or leather bucket. Loss of muscle power often requires considerable training before the stump is in condition and the artificial appliance can be used satisfactorily.

The peg leg takes the bulk of the weight on the tuberosity of the ischium and eliminates the troublesome pressure on the perineum. The standard limb which is used later is made of seasoned willow. The toes are of felt, the foot of maple, and the ankle bushing of bronze working in leather. In the knees the control is from inside the bucket.

Experience has demonstrated that a very complicated artificial arm is not satisfactory. A light dress arm of wool controlled at the elbow from the opposite shoulder with a catch lock and a detachable hand is the type supplied for all amputations above the elbow. For the forearm the same pattern without elbow control and with a leather corset about the upper arm is substituted. The working arm is a simple leather bucket reinforced with a band steel to which is attached a short steel tube into which may be inserted a special clasp hook or a lighter hook of the Dorrance type.

Many persons need encouragement by example and contact with others similarly afflicted who are able to accomplish useful tasks. R. B. COFIELD.

ORTHOPEDICS IN GENERAL

McChesney, C. J.: Plaster Methods of Treating Muscle Contractures Following Wounds. *California State J. M.*, 1919, xvii, 395.

The author describes in detail the plaster methods of treating contractures of the hip, knee, ankle, shoulder, forearm, wrist and fingers, supplementing his description with 16 illustrations.

For the adduction deformity of the hip he recommends gradual abduction by strong traction on a

Jones abduction frame, or immediate abduction under anæsthesia on a Hawley table and fixation in plaster.

For flexion deformity at the knee, a plaster cast, well padded over the patella, is recommended. After a few days the cast is cut two-thirds of the way round at the knee and as much extension is made as the patient can stand, a cork being inserted to keep the gap open. The whole is then sealed over with a few turns of plaster bandage. This procedure is repeated once or twice a week, the seal of plaster being removed and a wider cork being inserted each time.

For contracture of the ankle a cast is applied from the top of the leg to the toes with maximum dorsiflexion and slight inversion of the foot. A wedge 1 or 2 in. wide is cut anteriorly over the ankle joint from malleolus to malleolus. The foot is then dorsiflexed to the limit of the patient's comfort, the gap being thus partially closed, and sealed with plaster. This is repeated once or twice a week until a right angle position is attained. The latter should then be maintained for from one to four weeks depending upon the tendency to relapse.

The same principle of treatment applies to adduction deformity at the shoulder, flexion at the elbow, pronation of the forearm, flexion at the wrist, and deformity of the fingers. The article contains an illustration of the Downs plaster slab splint for flexing the phalanges of the fingers.

McChesney states that the plaster treatment is never intended to supplant massage and treatment by exercise but rather to attack the contracture in its most resistant stages, stretch the tissues in the shortest possible time to full or over-correction, and then gradually give way to massage and exercises which maintain or increase the correction while restoring activity and suppleness to the affected muscles.

PHILIP LEWIN.

Ochsner, E. H.: Potential and Acquired Static Flat-Foot. *N. York M. J.*, 1919, cx, 745.

Potential flat-foot is a weakened condition of the arch due to disproportion between the strength of the foot and the strain to which it is subjected, the latter, however, not being sufficiently severe to break the arch. Acquired static flat-foot is an acquired compound deformity in which the bones of the foot assume an abnormal relation to each other and to the leg. As a result there is improper distribution of weight and strain, and abnormal function and loss of the arch.

The normal shape of the foot is maintained by the shape of the bones, by the ligaments and fascia, and finally by the muscles. If there is disproportion between the weight borne and the strength of all of the factors mentioned, the longitudinal arch gives way and flat-foot results. The muscles are the first to settle, next the ligaments and fascia, and lastly the bones. The chief muscles involved are the tibialis anticus and posticus. If these become weakened or overstretched, the foot becomes abducted and

everted, the weight of the body being borne internally to the center of the arch. In extreme cases this results in a change in the shape of the tarsal bones.

Muscle weakness, excessive weight bearing, and faulty footwear are etiological factors. In 57 to 61 per cent of the cases the condition appears at about the age of puberty. In the selection of shoes, the proper length and width are usually obtained, but no attention is paid to the height of the shoe. If this is incorrect, severe pressure is made on the instep.

Arch supports do not cure flat-foot. They relieve the tibialis anticus and posticus muscles from all function and thus cause still further atrophy. Cyanosis, coldness, numbness, sweating of the feet, fatigue on the slightest exertion, and general dis-

comfort are the first symptoms. Outward deflection of the tendo achillis is a never-failing early sign. Pain may be felt at several different areas of the foot. Leg and back pains may also be due to flat-foot.

Shoes must be of the proper length and width. Stockings must not be too short or tight over the instep. Exercising the tibialis anticus and posticus is of greatest value in the treatment. Adhesive strapping when properly applied is also of the greatest importance. The strips should be applied to the leg and foot with the foot in inversion and adduction. They should be left on from four to eight weeks and re-applied as often as necessary until a cure has been obtained. A symptomatic cure may be expected in almost every case. J. J. KURLANDER.

SURGERY OF THE SPINAL COLUMN AND CORD

Lund, F. B.: Tumors of the Anterior Surface of the Sacrum. Case 1. Chordoma. Case 2. Sacrococcygeal Dermoid. *Boston M. & S. J.*, 1919, clxxx, 704.

The term "chordoma" is applied to growths arising in the center of the intervertebral discs from the remains of tissue of the notochord. They consist of vacuolized cells suspended in a gelatinous matrix.

Altogether 16 cases of these tumors have been reported clinically, 10 of them arising from the base of the skull, 5 from the sacrococcygeal region, and 1 from a cervical vertebra. Chordomata are distinctly malignant, 80 per cent of the cases showing recurrence after operation.

The case reported by Lund was that of a woman 60 years of age who for two years had suffered from pain and pressure symptoms over the sacrum and in the rectum. Examination revealed a tumor the size of a mandarin orange over the anterior surface of the sacrum which was smooth, round, elastic to the touch, and rather hard. At operation it was found that the tumor had perforated the sacrum and spread out over its posterior surface. The tumor and most of the sacrum were curetted away and the cavity was packed with gauze. Because of profuse hæmorrhage, the operation was terminated as quickly as possible. The patient died suddenly two months later from an unknown cause.

Sacrococcygeal dermoids vary greatly, ranging from simple cysts to those containing muscle, hair, bone, and sometimes even rudimentary organs. They are all encapsulated. Occasionally they rupture into adjacent organs and often they simulate uterine fibroids, ovarian cysts, or anterior spina-bifida.

Lund reports the case of a woman, 24 years of age, who for two years and a half had suffered with pain on the left side and in the middle of the back, constipation, and pain on coitus. Menstruation did not begin until she was 21. Examination revealed a large, soft, and fluctuating tumor which filled the

hollow of the sacrum and pushed the rectum forward. The cyst was exposed by a Kraske incision, as much of the sac dissected away as possible, and the cavity iodized thoroughly. Recovery was uneventful.

LOUIS HANDELMAN.

Ely, L. W.: Ankylosing Operations on the Tuberculous Spine. *Ann. Surg.*, 1919, lxx, 744.

Ely reports a case of tuberculosis of the tenth thoracic vertebra in a boy 4 years old. In August, 1918, a Hibbs operation was performed, and in January, 1919, a second operation was done. In this second operation a long incision down to the vertebra was made at the site of the previous operation and a piece of the cortex removed from the tibia with a circular saw was sutured to the laminae with kangaroo tendon.

In April, 1919, following the child's death from meningitis, the affected portion of the spine was obtained for examination.

Posteriorly the periosteum was tightly adherent. When this was dissected off, a solid bridge of bone was found uniting the eighth, ninth, tenth, eleventh, and twelfth thoracic and the first lumbar vertebrae. This bridge was seen to be the result of the union of the laminae produced by the Hibbs operation reinforced by the graft which was united firmly to the lateral masses. The bony structure of the graft was continuous with that of the receiving bones.

Anteriorly, the bodies of the eighth, ninth, and tenth thoracic vertebrae were badly diseased. A large portion of them, especially on the left side, had been destroyed.

The conclusions drawn by the author in regard to ankylosing operations for spinal tuberculosis are as follows:

1. They are curative in a large proportion of cases.
2. They ankylose neighboring sound joints but not the diseased joints and provide simply a splint for the affected region. Hence they give rest and

nothing more. Occasionally the disease progresses after operation and a second intervention above or below the first is necessary when the tubercle bacilli invade the bone marrow above and below the ankylosed area.

3. They greatly shorten and simplify the treatment. Complications such as abscess formation and paraplegia seldom develop afterward.

4. They are serious operations. Several deaths directly attributable to them have been reported.

Opinions differ as to the relative merits of the Albee and Hibbs methods but Ely prefers the latter. He admits, however, that it is more difficult and requires two hours for its completion whereas the Albee operation can be performed in three-quarters of an hour or less.

E. H. POOL.

SURGERY OF THE NERVOUS SYSTEM

Auvray: The End-Results of Operations upon 39 Wounds of the Radial Nerve Performed in 1915 and 1916 (Resultats éloignés de 39 plaies du nerf radial opérées en 1915 et 1916). *Bull. et mém. Soc. de chir. de Par.*, 1919, xlv, 1291.

Thirty-one of the 39 cases of radial nerve injuries operated upon by Auvray have been traced. In 15 there had been simple liberation of the nerve; in 11, an end-to-end suture; in 2, suture of the upper end to the lower end; in 1, an anastomosis to the internal brachial nerve; in 1, the insertion of a graft of the internal brachial nerve; and in 1, the excision of a cicatricial nodule.

There were 17 recoveries. In 5 there was definite improvement but not complete recovery; in 2 there was slight improvement; and in 7, no improvement.

Auvray therefore concludes that the results of surgical operations upon wounds of the radial nerve may be considered very satisfactory since of the 31 patients operated upon 22 reported a cure or very great improvement after a long interval.

Liberation of the nerve and suturing have given equally good results. In 15 cases of nerve liberation, recovery or very great improvement resulted in 12, while in 11 cases of suture there were 8 recoveries. These good results occurred in even the most severe injuries of the radial nerve and though the operation was performed a long time after the injury.

At the last congress of the Société de Chirurgie it was proposed to remedy radial paralysis by early recourse to tendon anastomosis. Auvray is of the opinion, however, that such anastomosis should be deferred as late as possible so that at the time of operation it is definitely certain that spontaneous restoration of the nerve is improbable. In certain cases functional restoration may occur only after several years.

By the term "recovery" in the cases referred to Auvray means that patients who were paralyzed for long months are now able to use their arms and have been able fully to resume occupations in civil life which require normal or almost normal functioning of the arm.

W. A. BRENNAN.

MISCELLANEOUS

CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

Harries, D. J.: Surgical Problems and Difficulties in the Tropics. *Indian M. Gaz.*, 1919, liv, 453.

A temperature of 104 to 106 in the shade does not preclude the use of ether as an anæsthetic, but may make necessary a larger quantity, particularly if a preliminary administration of morphine has not been given.

While the headgear and mask are very uncomfortable in these hot climates, they are worn by the operator as, in addition to their other functions, they retain the perspiration.

As the tissues of persons in the tropics bleed freely it is necessary to ligate all bleeding points and apply compression bandages after operation whenever possible. Bleeding may start as late as the date when the stitches are removed. Whatever the cause, clotting of the blood is greatly delayed.

Because of its frequency, malaria must always be considered among the causes of postoperative fever.

When malaria is latent in the body an acute attack may be precipitated by operation, possibly by reason of mental worry, trauma, or the anæsthetic. So-called "abdominal malaria" may simulate acute peritonitis. Such an abdomen opened in error showed the intestines to be slightly injected and covered with a thin layer of a milk-like substance which here and there formed small collections between the coils.

Acute dysenteric abscess of the liver presenting in the epigastric region may develop within forty-eight hours and may be mistaken for perforation of the bowel or gastric ulcer.

Orthopedic appliances are poorly borne in the tropics as the skin rapidly becomes irritated, making even slight pressure intolerable.

K. L. VEHE.

Smith, F. M.: Studies on Hyperthyroidism. *J. Am. M. Ass.*, 1919, lxxiii, 1828.

This report is based on the study of 30 men in whom the physical findings were suggestive of hyperthyroidism. These consisted of rapid pulse,

enlargement of the thyroid gland, fine tremor of the hands, moist, clammy palms, and some of the eye signs usually associated with exophthalmic goiter. The object of the author's observations was to determine whether or not the thyroid gland was the basis of these findings.

In addition to the usual routine physical and laboratory examinations, glucose was given by mouth to determine the patient's sugar tolerance. The response to epinephrin and the effect of thyroid feeding were also noted.

The sugar-tolerance test was made in the following manner: The patient was not allowed to have breakfast. About 8 a.m. a sample of blood was taken for the initial blood-sugar determination. The patient was then weighed, after which he was given a glucose drink containing 1.75 gm. of glucose per kg. of body weight dissolved in from 250 to 300 c.c. of water. In the early part of the investigation, blood was taken for sugar determinations at intervals of one-half, one, one and one-half, two, and three hours following the administration of the glucose, but later the author was interested only in whether or not the blood sugar returned to the fasting value within the two-hour period. The readings were made at two- and three-hour periods. Specimens of urine were obtained and examined for sugar immediately after the samples of the blood were taken.

For the epinephrin test the Goetsch method was employed. The men were put to bed in a quiet room. After the pulse and blood-pressure readings became constant, 5 c.c. of 1:1000 epinephrin (adrenalin) solution were injected into the deltoid muscle. Records were made of the pulse, respiration, and blood pressure every two minutes for ten minutes, and then every five minutes for one hour. Following this, observations were made at ten-minute intervals for one-half hour, and in the meantime any subjective symptoms that arose were carefully noted. The reaction was considered positive when there was an increase of from fifteen to twenty points in the pulse rate and blood pressure, accompanied by an exaggeration of the tremor of the hands, nervousness, palpitation of the heart, and arterial pulsations.

For the administration of thyroid gland, the men were put to bed and isolated in one end of the ward. The desiccated thyroid gland of sheep was used. The initial dose was $\frac{1}{4}$ gr. morning and evening. This dose was increased $\frac{1}{4}$ gr. each day and continued until there was a response or until the patient was getting 5 gr. a day. The pulse was taken four times a day and whenever possible while the men were asleep. A definite increase in pulse rate during sleep, associated with increased nervousness and irritability, was regarded as a positive reaction. The administration of thyroid was then discontinued.

The majority of these men had responded well to military service. Only four gave a history of being unable to do their work. Practically all of them were

convalescing from influenza and had been retained in the hospital because of their rapid pulse. In 8 cases the influenza was complicated by pneumonia; in 2, the pneumonia developed during the course of measles.

The predominating symptom was nervousness. Twenty-four made this complaint. In addition, 10 of the men had palpitation of the heart, shortness of breath, dizziness, and a feeling of exhaustion on exertion. The remaining 6 had no complaint other than slight weakness which was to be expected during the period of convalescence from influenza.

In 8 cases these symptoms were not noted prior to the recent illness. In 15, the onset dated back two, three, four, and six years, and in a few even to childhood. As far as could be determined the army service had not aggravated the symptoms except in 3 instances. These 3 men had become more nervous and had lost from 10 to 15 lbs. in weight in the last two months, but were able to work fairly well.

All the men, except 2, had a lagging of the upper lids (von Graefe's sign). This sign was variable; one day it was marked and the next day not demonstrable. In 10 cases there was an apparent widening of the palpebral fissure (Stellwag's sign). In none was there a distinct exophthalmos.

In every case the thyroid gland was markedly enlarged, and in the majority of cases the right lobe was the portion involved. On palpation the gland was found to be soft, with the exception of an occasional firmer area in either the upper or the lower pole.

The pulse reading was made in each instance after the patient had been quiet in bed for several minutes. In practically all cases it ranged from 90 to 100. One of the noticeable features was the marked increase under the least excitement.

The blood pressure was based on several determinations made under uniform conditions. In 20 cases it was about normal for men between 20 and 30 years of age. In 10, the systolic pressure ranged from 130 to 155, and in 1, it was as high as 170 mm. of mercury. In none were there any evidences of kidney lesions.

The blood counts were always made from two and a half to three hours after breakfast. In a few cases there was a slight polymorphonuclear leucocytosis. In 4 men this was accounted for by a slight tonsillitis which disappeared in a few days. In the other cases it could not be explained. In 9 cases there was a relative increase in the small mononuclear cells above 30 per cent.

In 6 cases the blood-sugar value ranged from 0.102 to 0.117 per cent at the two-hour period.

Six men were definitely sensitive to small doses of desiccated thyroid gland. This was manifested by an increase in the pulse rate, flushing, nervousness, and palpitation of the heart. In 2 cases the reaction was noted when they were receiving $1\frac{1}{2}$ gr. a day; in 1, when 2 gr. were given, and in 3, when $2\frac{1}{2}$ gr. were given. In the remaining cases doses of 5 gr. a day had no appreciable effect.

Eleven men responded positively to the epinephrin test. In 2 other cases there was a reaction which was considered sufficiently definite to record as positive. The 6 patients who were hypersensitive to desiccated thyroid gave a positive response to epinephrin.

The author summarizes his observations as follows:

1. In 6 instances hyperthyroidism was the final diagnosis. This diagnosis was based on the response to thyroid feeding, the reaction to epinephrin, and the blood-sugar curve following the administration of glucose. The results of the thyroid feeding were considered the most reliable evidence in favor of the diagnosis made. This was further substantiated by a positive response to epinephrin and a suggestive disturbed carbohydrate metabolism.

2. Seven cases were diagnosed as irritable heart. In 5 instances this trouble had been present prior to the patient's entrance into military service. In 2 cases it seemed to be the result of influenza.

3. Seventeen cases were diagnosed as simple tachycardia. In 16 instances no cause was found. None of the cases diagnosed as irritable heart or simple tachycardia responded to doses of 5 gr. of desiccated thyroid, nor was there any suggestion of disturbed carbohydrate metabolism.

G. W. HOCHREIN.

Regnault, J.: The Early Diagnosis of Cancer by Electrical Reaction of the Visceral Reflexes (Le diagnostic précoce du cancer par les réactions électroniques des réflexes viscéraux). *Presse méd.*, Par., 1919, xxvii, 588.

The author states that every kind of matter which throws off electrons and every organism that functions is surrounded by an electronic field. Cancer, which develops as a parasite and has great proliferative activity, is surrounded by a powerful electronic field which has peculiar characteristics of polarity, intensity, and syntonization. The malignancy of a tumor and the exact limits of its invasion, therefore, may be determined by electrical reactions of the visceral reflexes. In this way also cancer may be recognized in its early stages when it may be operated upon under the most favorable circumstances. Studies on polarity and especially on syntonization of cancerous energy suggest in addition the possibility of restricting or destroying the malignancy of a tumor before operation. W. A. BRENNAN.

Boggs, R. H.: The Treatment of Malignancy by Combined Methods. *Am. J. Roentgenol.*, 1919, n. s. vi, 481.

Since no single method is uniformly successful in combating malignancy, the author maintains that every available means should be employed in the treatment, and combinations of methods should be used when indicated. Thus surgery may be advantageously combined with postoperative radiotherapy and in some cases with ante operative radiation. Removal by the knife may be supplanted advantageously in some cases by electric coagulation since the latter

destroys tissue without opening the blood and lymph vessels and thus prevents the dissemination which might occur following a cutting operation. Operation may be combined also with radiation.

As regards the form of radiation to be used, both radium and roentgen rays answer certain indications and frequently their combined use is preferable to the use of either separately. When a localized reaction is desired, radium is to be preferred, but if large areas are to be treated, roentgen rays are of greater benefit. In many instances radium should be employed locally, the adjacent lymphatics being treated with the roentgen rays.

As regards specific lesions, radiation should always be considered first in the treatment of epitheliomata because, when properly applied, practically all epitheliomatous tissue will disappear and fewer recurrences follow this than any other method. In most instances surgery and electric coagulation should be employed as an adjunct. In the treatment of carcinoma of the breast the entire lymphatic supply must be taken into consideration and the radiation must be sufficiently extensive to cover it entirely. In carcinoma of the uterus, if radiotherapy is applied as a prophylactic measure after operation or used in recurrent or inoperable cases, the radium should be used locally and all the visceral and inguinal glands should be treated with the roentgen rays with as thorough crossfiring as is advised for uterine fibroids.

In conclusion, the author states that today when removal is necessary the combined or selected methods of radium, roentgen rays, and surgery provide the only rational and efficient means of treating malignancy. The consultant should be thoroughly conversant with principles that have been established, experienced, and without prejudice. Sufficient data have been produced in the past fifteen years to give radiotherapy a sound and rational place in the treatment of malignancy. This has been accomplished by the teamwork of the clinician, pathologist, surgeon, and radiotherapist. The data are so conclusive that there is no excuse for experimenting or selecting the wrong method of treatment. ADOLPH HARTUNG.

Broders, A. C.: Benign Xanthic Extraperiosteal Tumor of the Extremities Containing Foreign-Body Giant Cells. *Ann. Surg.*, 1919, lxx, 574.

The author reports 17 cases of tumors of the soft parts of the extremities. These tumors are characterized by their yellow color and the presence of foreign-body giant cells in the stroma. Heretofore they have been classed as spindle-cell sarcoma, myeloid sarcoma, myeloid tumor, myeloma, myeloid endothelioma, myeloxanthoma, granuloma, giant-cell sarcoma, and giant-cell tumor.

The opinions as to the malignancy or benignancy of these tumors and as to their origin have been numerous. Because of the foreign-body cells which resemble osteoclasts, it has been suggested that they arise from bone-forming tissue, such as the perioste-

teum or endosteum. Some have suggested that they have their origin in the endothelium of the blood vessels. Others have stated that they are not true tumors and should not be called giant-cell sarcomata, being in reality inflammatory granulation growths.

Of the 17 cases reported, 11 were those of females and 6 those of males. The average age of the patients was 47.2 years. The oldest was 65 years and the youngest 21. Ten of the lesions were in the upper extremity and 7 in the lower. The average duration of the tumor was seven and six-tenths years, the longest twenty-four years, and the shortest eight months. Twelve patients were treated by local excision of the growth, 2 by local excision and cautery, and 3 by amputation of either a toe or a finger.

Pathologically, these growths are encapsulated, of a firm consistency, and divided into cellular and fibrous areas. In the cellular areas are small lymphocytes, fibroblasts, endothelial cells, and foreign-body giant cells. "Foamy lipid or xanthoma cells" were demonstrated in all tumors. The growths are quite vascular as shown by numerous blood vessels and blood spaces.

In discussing the relationship of the foreign-body giant cell to the tumor, the author suggests two views, viz., that of MacCallum, according to which these cells arise from lymphocytes, and that of Mallory, according to which they have their origin in the endothelial cells lining the blood vessels. It is the author's opinion that they are similar in function and morphology to the osteoclasts of bone, that they are "clean-up cells" which absorb foreign material such as old blood pigment or cholesterol crystals, and that they have a definite purpose in the tumor. There is no relationship to bony tissue, however, for foreign-body giant cells are often found in the soft tissues far from bony structures.

On the basis of the pathologic picture, the clinical history, and the ultimate postoperative results (none having recurred), Broders concludes that the tumor described should be classed as a benign condition, that it is probably the result of extravasation of blood following an injury or an infection, that it resembles a granuloma rather than a true neoplasm, and that it should not be called a sarcoma.

The paper is illustrated with 22 photomicrographs, 3 photographs of gross specimens, and 1 color drawing of a xanthic tumor of the second toe which shows most clearly the close relationship of the tumor to the tendon sheath. A. E. MAHLE.

Gordon, A. H.: Internal Hydrocephalus and Xanthochromia of the Spinal Fluid. *Canadian M. Ass. J.*, 1919, ix, 1005.

The syndrome of Froin consists of a spinal fluid of yellow color (xanthochromia) which coagulates *en masse* and shows an abundant lymphocytosis. The syndrome of Nonne consists of a spinal fluid showing a marked increase in globulin without an increase of cellular elements. These features may

be complete or partial and there may be variations in several of the factors. There may be, for example, absence of xanthochromia, cases showing only xanthochromia and massive coagulation, cases showing yellow colored fluid without the massive coagulation, and cases showing yellow coloration and cellular increase with large amounts of albumin but no massive coagulation.

In the case reported in this article lumbar puncture was done on three occasions and each time the fluid was orange yellow but did not coagulate. The Noguchi reaction and the Nonne reaction were double plus. The cell count was 250 per cubic centimeter and the lymphocytes 90 per cent. At autopsy the dura was found to be quite tense. The brain was large and filled the cranial cavity. The convolutions were flattened and the sulci obliterated. The vessels were prominent and the meninges smooth. The vessels were not atheromatous and no acute or chronic inflammatory process was recognized. The brain was flattened out against the surface on which it rested. The lateral ventricles were markedly distended with fluid which showed no yellow color. All of the ventricles were correspondingly enlarged. There was no evidence of pus or blood, tumor or adhesions. The foramen of Magendie could not be identified.

The syndrome of Froin or xanthochromia alone usually indicates the isolation of one portion of the subarachnoid space from the rest by tumors, adhesions, etc. This separation is usually found at the lower levels of the cord. Internal hydrocephalus may be associated with separation of the spinal from the cerebral arachnoid space either by adhesions of the brain stem to the tentorium or by hernia of the distended brain into the foramen magnum.

Reference is made here to the two types of hydrocephalus, communicating and non-communicating. In the communicating type, one or more foramina remain open in the roof of the fourth ventricle, forming a communication with the spinal subarachnoid space, but on account of the adhesions between the brain stem and tentorium there is no communication between the ventricles and the cerebral arachnoid space. In the non-communicating or obstructive type all the foramina are closed and no communication between the ventricles and the subarachnoid space is possible.

The conclusions are that the cerebrospinal fluid is formed in the ventricles by the choroid plexus, but that there is no absorption from the ventricular cavities as all absorption takes place from the subarachnoid space. When the subarachnoid space is shut off, therefore, either in whole or in part, hydrocephalus results. The injection of phthalein into the ventricles is the method of determining this clinically. In the communicating type the phthalein finds its way readily into the spinal subarachnoid space. In the obstructive type it does not appear in the spinal space.

A partial explanation of Froin's syndrome lies in the separation of the sacculated portion of the sub-

arachnoid space from the choroid plexus through which it is normally filtered and a reversion of its contents to a simple lymphoid material which is yellowish, coagulating, and cellular. I. W. BACH.

BLOOD

Langstroth, L.: Blood Viscosity. I. Conditions Affecting the Viscosity of Blood after Withdrawal from the Body. *J. Exper. M.*, 1919, xxx, 597.

As in determinations made in the Laboratory of the University of California Hospital, San Francisco, in connection with work on cyanosis the blood viscosity was found to be influenced by so many factors hitherto unconsidered, it appeared to the author that a more thorough investigation of the subject seemed warranted.

Langstroth therefore carried out a series of experiments to ascertain the effect on the blood of oxalate, insufficient mixing, standing in contact with the air, and variations in temperature. He describes these experiments in more or less detail and summarizes the results as follows:

Small amounts of potassium oxalate had no effect on the viscosity of the blood and the changes hitherto ascribed to it may be attributed to either variation in the carbon dioxide content or sedimentation of the red blood cells.

The viscosity of blood when exposed to the air increased rapidly. This change accompanied a loss of carbon dioxide and was prevented by putting a stopper in the container and agitating the blood until it came into carbon dioxide equilibrium with the air above it, when the viscosity remained constant.

In determining the viscosity of the blood it was essential to have the red cells uniformly suspended throughout the plasma. Such uniform suspension was obtained by rotating 5 or 10 c.c. of the blood in a separating funnel for one minute. G. E. BEILBY.

Langstroth, L.: Blood Viscosity. II. The Effect of Increased Venous Pressure. *J. Exper. M.*, 1919, xxx, 607.

The author speaks of the attempt made early in the investigation of blood viscosity to study the effect *in vivo* of an increase of carbon dioxide by determining the coefficient before and after the venous stasis induced by the application of a loose binder. The assumption was that by raising the venous pressure for a time the passage of arterial blood through the capillaries would be delayed and the amount of carbon dioxide increased. It was believed that an increase in carbon dioxide would increase the viscosity, since it had been shown *in vitro* that saturating blood with carbon dioxide increases the internal resistance. It seemed possible also that a concentration of red blood cells in the capillaries might accompany the increase in viscosity for it has been shown that in shock the capillary count is higher than the venous.

The common method of taking blood from a finger, even when a spring lance was used, did not seem to offer the possibility of obtaining 0.2 c.c. of blood rapidly enough to fill the viscosimeter without a considerable loss of carbon dioxide, and it was found difficult to prevent small bubbles of air from entering the instrument. The attempt to use capillary blood was therefore given up and only venous blood was employed.

A few preliminary determinations of hæmoglobin with the Palmer method showed such a rapid deterioration of the standard that values obtained with it on different days were not comparable. This did not affect the comparative value of determinations made on the same day, however, and therefore the 1 per cent standard was used often even though the absolute hæmoglobin value was not obtained.

Langstroth carried out a series of experiments to determine the effect of an increase in venous pressure on both venous and finger blood and on hæmoglobin; also the relation of the carbon dioxide content, oxygen unsaturation, and oxygen-carrying power to viscosity. These experiments he describes in some detail, and summarizes the results as follows:

A rise in venous pressure caused by the application of a loose binder to the arm resulted in a marked increase in the viscosity of the whole blood which was due primarily to a concentration of the blood in the capillaries. This concentration was shown by an increase in the viscosity and total nitrogen of the plasma, in the relative volume of the red blood cells, and in the relative percentage of hæmoglobin.

A change in the viscosity of whole blood following venous stasis apparently bore no demonstrable relation to the carbon dioxide or oxygen content.

G. E. BEILBY.

Corachán, M., and Gallart Mones, F.: A Study of the Coagulation of the Blood as Indicating the Prognosis in Surgery (El estudio de la coagulación sanguínea como dato pronóstico en cirugía). *Siglo méd.*, 1919, lxvi, 935.

Since hæmorrhage and thrombosis are probably the most dangerous of the postoperative complications and the most difficult to avoid, the authors undertook a series of experiments to determine the reliability of Bloch's method of testing the coagulability of the blood.

The technique used in the tests is described in detail. The persons whose blood was tested were not chosen at random or successively as they entered the service but were selected as far as possible because their histories indicated that an abnormality of coagulation might be expected.

Of the 56 cases in which the test was made a normal index was found in 36, an index lower than normal in 18, and an index higher than normal in 2. Those in which the index was abnormal are described at length. The authors conclude as follows:

1. Bloch's process is to be preferred because it does not prevent the ultimate coagulation of the blood.

2. Citrated blood is very similar to the blood in the vessels.

Blood with a normal coagulation index begins to coagulate in the tube in which the relation between the sodium citrate and the calcium chloride is as 2:1. In the tube in which the relation is as 1:1 the coagulation is complete.

4. A daily dose of 3 or 4 gm. of calcium chloride by mouth markedly increases the coagulation index.

5. The coagulation index of patients who develop postoperative hæmatomata is below normal.

6. Patients with a low index respond to treatment with calcium chloride and gelatine with a rise to normal in the coagulation index.

7. In cases of venous thrombosis the index is normal. The thrombosis is not due entirely to the high coagulation index but to other concurrent factors, primary among which is infection.

M. M. MATTHIES.

Hanzlik, P. J., and Weidenthal, C. M.: The Plasma and Blood-Clotting Efficiency of Thromboplastic Agents in Vitro and Their Stability. *J. Pharmacol. & Exper. Therap.*, 1919, xiv, 157.

The authors have previously shown that the entire group of hæmostatic agents are rather limited in their usefulness, a fact which is due in part to the difficulty of applying crucial tests to determine their efficiency under the actual conditions of wound hæmorrhage. Particularly was this true of the thromboplastic type of agents derived from tissues or blood. The claims made for the hæmostatic qualities of these appear to be exaggerated when it is remembered that, whatever their origin, hæmorrhages are most capricious and generally cease spontaneously, even in hæmophilia.

In the authors' opinion there is no doubt that kephalin at least accelerates the clotting of oxalate and peptone plasma in the presence of fresh serum *in vitro*. It is largely because of this that its use in hæmorrhages has been advocated. Lack of success with these agents has been attributed to the use of old and deteriorated products. It is conceivable also, in the authors' opinion, that their activity varies with the dosage and concentration.

It is the purpose of this paper to compare the thromboplastic activity of several different products, the activity of fresh and old preparations, and the relation of the concentration of the products to their activity *in vitro*.

The results of the authors' investigations are summarized as follows:

The kephalin and thromboplastin type of thromboplastic agents accelerated definitely and rather markedly the coagulation time of blood and oxalate plasma *in vitro*, while coagulen, hæmostatic serum, and coagulose were practically inactive.

In descending order of thromboplastic activity with peptone plasma, the agents tested were as follows: thromboplastins, kephalin, coagulen and hæmostatic serum (inactive).

In descending order of efficiency the freshly obtained or freshly prepared thromboplastic agents tested for plasma and blood clotting *in vitro* were: (1) thromboplastin (Squibb), (2) thromboplastin (Armour), (3) kephalins (fresh and some old specimens, Armour, etc.), (4) coagulen (Ciba), (5) coagulose and hæmostatic serum (Parke, Davis & Company) and normal saline. The thromboplastins possessed from three to seven times the clotting efficiency of kephalin and shortened the coagulation to from one-twentieth to one-tenth as compared with normal saline. The kephalins (0.1 per cent, fresh and some old) possessed about one-seventh to one-third the activity of the thromboplastins, but as compared with saline shortened the coagulation time to from one-third or one-half. Fresh coagulose, hæmostatic serum, and coagulen did not accelerate clotting.

Both the kephalins and thromboplastins lost their thromboplastic activity on standing. The change in kephalin varied most since some specimens of from nine to twenty-two months' standing were as active as the freshest, while others of the same age were only about half as active. Deterioration of kephalin was demonstrable at the end of about two months. Specimens of thromboplastin nine and twenty-two months old taken from different sources possessed about one-eighth to one-third the activity of the freshest specimens from the same sources and the same activity as the freshest kephalin. An old thromboplastin (thirty-two months) and a very old kephalin (seven years) were entirely inactive. Fresh or old coagulen (dry or in solution in ampoules), fresh hæmostatic serum, and fresh coagulose have no demonstrable thromboplastic activity *in vitro*.

The range of optimal concentrations of kephalin for hastening the coagulation time of plasma was from about 0.06 to 1 per cent. Beyond these limits the coagulation was retarded. The coagulation accelerating activity of the thromboplastins (Armour and Squibb) was directly proportional to the concentration, indicating a difference in mechanism of action from kephalin. Coagulen, coagulose, and hæmostatic serum in both high and low concentrations gave variable results, indicating on the whole a total lack of accelerating thromboplastic activity in these agents.

G. E. BEILBY.

Hanzlik, P. J., and Weidenthal, C. M.: The Hæmostatic Properties of Thromboplastic Agents under Different Conditions. *J. Pharmacol. & Exper. Therap.*, 1919, xiv, 189.

Practically all thromboplastic agents, though differing in origin and composition, are claimed to be specific for or indicated in the treatment of hæmophilia, melæna neonatorum, etc. In fact, these remedies are advised for all hæmorrhagic tendencies, even hæmorrhages occurring in normal persons. Under these conditions it would appear that the use of thromboplastic agents was irrational and not indicated. On the other hand, if it could be

shown that a hæmorrhagic tendency actually represents a deficiency of kephalin, or if the mechanism through which kephalin and similar agents act were unfavorably balanced, such, for instance, as by an excess of antiprotease which might be the case in hæmophilia, kephalin and similar agents would be indicated logically. However, the proof that these disturbances are present in or constitute the etiology of hæmophilia does not as yet appear to be sufficiently well established. The scarcity of hæmophilia material limited the testing of the thromboplastic agents as hæmostatics to ordinary (normal) bleeding, but the authors were able at least to test the favorable claims made for these agents in bleeding from surgical wounds of normal individuals.

The ineffectiveness of kephalin and thromboplastin (Squibb) in this direction was indicated in previous studies on quantitative changes in bleeding from superficial wounds of the dog's pad. As in these experiments most of the pads were irrigated with a 1 per cent citrate solution, which in this concentration was found to interfere with the activity of kephalin, a final decision concerning its hæmostatic qualities was not made. The authors therefore decided to extend the experiments, using the agents in a saline instead of a citrate solution and under conditions which would be as favorable as possible and yet preserve the quantitative features. To a certain extent the original difficulties were overcome, though not completely. The wounds under these conditions did not represent the bleeding wounds seen in clinical practice. However, in irrigated wounds it was possible at least to obtain controls of the bleeding from one and the same wound. The bleeding from different wounds, even though they were made to appear as much alike as possible, was variable so that without some kind of controls the results were meaningless. Beside irrigation experiments, observations were made also along clinical lines on hæmorrhages from large arteries, liver and bone wounds, and intestinal bleeding in a case of hæmophilia. None of the results obtained under these conditions, however, was gratifying.

The agents used and the sources from which they were obtained have been described by the authors in a previous paper. They summarize their findings as follows:

The hæmostatic effects of the thromboplastic agents tested on superficial hæmorrhage from the dog's pad, although limited and variable, in general tended to agree with the agent's powers of accelerating the coagulation of blood and plasma *in vitro*. Accordingly, the thromboplastins and kephalin were among the most active. Saline and coagulen and hæmostatic serum were either inactive or doubtful.

The extreme variability of results obtained after the application of various thromboplastic agents to dissected femoral arteries bleeding into Scarpa's triangle, and the results in untreated vessels under similar conditions, indicated that this method of testing was unreliable and unsatisfactory. If

anything, the results indicated the worthlessness as hæmostatics under these conditions of kephalin, coagulen, and hæmostatic serum, and probably also of the thromboplastins.

The application of various thromboplastic agents to bone and liver wounds of a dog gave unsatisfactory results. On the whole the results were negative and did not support the claims that have been made for these agents.

The administration of 4 gm. of kephalin by mouth to a patient with hæmophilia suffering from a troublesome intestinal hæmorrhage was followed by the prompt cessation of the bleeding and the shortening of the coagulation and bleeding time of the ear blood. This the authors do not consider as due necessarily to the kephalin, however, since bleeding in this patient was known to have stopped spontaneously before the treatment. It illustrates therefore the necessity for exercising the greatest care in interpreting data of this sort. G. E. BEILBY.

Lacoste, Lartigaut, and Piqué: The Results of 36 Blood Transfusions in the Treatment of Patients with War Shock (Resultats de 36 transfusions du sang chez des shockés de guerre). *Bull. et mém. Soc. de chir. de Par.*, 1919, xiv, 1261.

In the authors' ambulance service 1,600 untransportable wounded men were received. In the cases of 36 of these patients (33 of whom were hæmorrhagic and 3 non-hæmorrhagic) blood transfusion was indicated. The transfusions were given either before operation, immediately afterward, or later.

From their study of these cases the authors draw the following conclusions:

In the cases of hæmorrhagic patients there is a remarkable parallelism between the findings of the clinical examination and the blood pressure. Hypotension measures the degree of decompensation. The persistent amelioration of the arterial pressure indicates a favorable outcome of the hæmorrhagic complications and suggests a favorable prognosis if there are no signs of infection.

Oscillometry as a means of arriving at a diagnosis and prognosis appears to be of the greatest value.

In addition to its aid from the standpoint of therapeutics, the systematic measurement of the arterial tension in shock following hæmorrhage has given the authors information regarding the comparative value of intravenous injections of isotonic salt solution and blood transfusion. The beneficial effects of salt solution, heat, and heart stimulants as translated by the increased tension noted by the oscillometer have in some instances made blood transfusion unnecessary. The cases treated by transfusion mentioned in this report were those in which the initial low tension persisted in spite of the use of salt solution and other treatment. Following blood transfusion this hypotension as a rule yielded definitely and rapidly and was associated with a striking improvement in the general condition.

A cardiovascular examination with Pachon's oscillogram demonstrates also the therapeutic value of the various agents used for posthæmorrhagic complications.

In concluding their article the authors emphasize the importance of measuring the arterial tension to establish criteria as to the advisability of blood transfusion in a given case. This information, in addition to the findings of the general clinical examination, gives the surgeon also the best indications for fixing the time of the transfusion.

Pachon's oscillogram is more than an ordinary sphygmomanometer. It is a very sensitive and practical instrument for studying the pulse and cardiac impulses which reveals pulsations imperceptible to the sphygmomanometer. The notation of the index and the construction of the oscillogram curve show at once the advantage of the instrument, for by this means it is possible to obtain in a series the results of different examinations and to perceive rapidly, easily, and accurately the modifications which follow the reaction to the use of different therapeutic agents. The war surgeon working almost incessantly at the operating table is enabled to follow the condition of shocked patients both before and after operation by glancing at their oscillogram curves between operations.

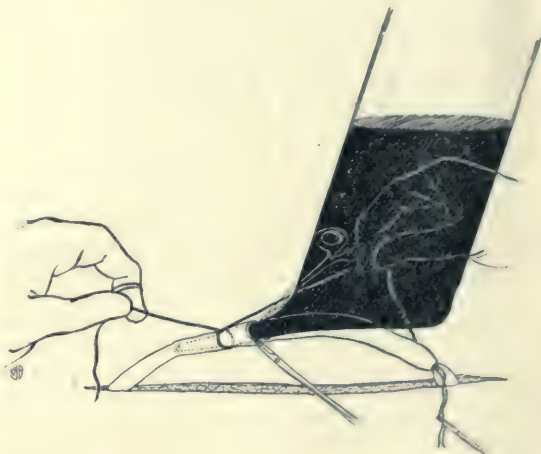
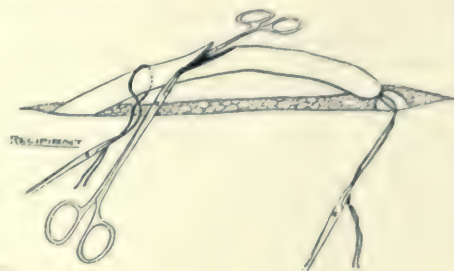
W. A. BRENNAN.

Shupe, T. P.: Some Aids in the Technique of Blood Transfusion by the Paraffin-Tube Method. *Surg., Gynec. & Obst.*, 1919, xxix, 608.

In a large number of blood transfusions performed in a British casualty clearing station and in private practice the following points were found to facilitate the procedure:

1. A well-paraffined tube.
2. Sharp dissecting instruments.
3. Exposure in both the recipient and the donor of at least an inch of vein without branches. If branches appear in the exposed portion, they should be tied.
4. A properly applied tourniquet on the donor.
5. A few ounces of 5 per cent sodium citrate ready on the table to be used for the prevention of clots in the tube. The tube should be dipped in the citrate solution before it is inserted in the vein. When the tube is refilled three or four times, a small fragment of clot may remain adherent to the side after it has been emptied. This small clot will form the nucleus of a larger clot, and make the injection of the contents of the refilled tube quite difficult or impossible so that a second tube will be required and from 100 to 200 c. c. of blood may be lost. This difficulty will be obviated if a few cubic centimeters of the citrate solution are injected into the large opening of the Vincent tube, shaken for a minute, and then allowed to run out, taking with them all small particles of residue blood.

The simple procedure described will also prevent the injection of clots into the vein and the danger of subsequent thrombosis.



Schematic drawing showing how suture can be passed around the tube and vein.

Shupe, T. P.: *Some Aids in the Technique of Blood Transfusion by the Paraffin-Tube Method.*

Blood clotting in the vein of the patient with low blood pressure and the consequent delay in opening a new vein each time a tube is filled are prevented by laying a gauze sponge saturated with a 5 per cent solution of sodium citrate on the exposed vein of the recipient immediately after the lumen has been opened, and keeping it in place while the tube is being filled.

By the use of a small amount of citrate in this way, whole blood, and nothing but blood, is given the patient. It is not necessary to mix citrate or any other substance with the blood to be injected.

6. The accompanying cut shows how a closed connection preventing any regurgitation of the blood between the vein and the tube can be made by crossing a linen suture around the vein and tip of the tube.

BLOOD AND LYMPH VESSELS

Hare, H. A.: Three Cases of Aortic Aneurism Treated by Wiring and Electrolysis. *J. Am. M. Ass.*, 1919, lxxiii, 1865.

The author has chosen for this report 3 typical cases of aneurism of the thoracic aorta from a total of 31 cases which he has treated by the insertion of

gold platinum wire followed by electrolysis. These are cases of very large aneurisms measuring 8 by 10 in. and 12 by 14 in. respectively which had invaded the chest wall.

For the type of treatment described the aneurism must be sacculated, not fusiform, and the most favorable results are obtained on those of the dissecting sacculated type. Operation may be performed before the aneurism has eroded the chest wall provided the field of operation is first explored by means of the X-ray and the point of greatest bulging is taken as the point of election. This point must be near enough to the chest wall, however, to obviate the necessity of going through the lung to reach the aneurism.

A gold-copper wire has proved useless because it is broken down in a few minutes by the electric current.

Great care must be taken in electrolysis that the skin and other tissues are protected by proper insulation of the needle through which the wire is passed.

The amount of wire required usually varies from 15 to 20 ft. The current starts at 5 ma. and is gradually increased to 50 ma. during the course of from forty minutes to an hour.

If the street current is used, care must be taken that it is properly reduced and that the patient and the operator and his assistants are insulated.

One of the results achieved by this method is the almost immediate and usually lasting decrease in the pain. The duration of life after operation has varied from a few hours in a desperate case in which there was pulmonary oedema to nine years in a case in which wiring was done twice, the second operation two years after the first. The difficulty in the way of permanent cure lies chiefly in the fact that in many cases the aortic lesion is a local manifestation of a general degenerative arterial change due to syphilis. When the lesion is due to trauma the results are better.

In one case the patient was not relieved by operation and the failure was found to be due to another aneurism just above the diaphragm which was eroding the vertebrae.

In all cases the progress of the growth was arrested, but in some the deflection of the blood current in another direction developed dilatation in a second area.

A remarkable fact is that in all Hare's experience no accident has occurred during the operation of wiring nor has any patient died after leaving the table as the result of the operation. It is of course of vital importance that the current should not be too strong lest it affect adjacent tissues.

GENERAL BACTERIAL INFECTIONS

Shera, A. G.: *Methods of Choice in Immunity.* *Lancet*, 1919, cxcvii, 909.

The author discusses the relative importance of endotoxin and exotoxin in the causation of disease by various organisms, and enumerates methods of

procedure applicable to different types of cases to be used in treating patients with infection. These are based on a principle which he considers axiomatic: against an exotoxin a serum should be employed, against an endotoxin a vaccine.

A full account is given of 20 cases, the majority wound infections, treated with serum, vaccine, or a combination of the two. Polyvalent antistreptococcus serum or autogenous vaccine, both sensitized and non-sensitized, were used. Of the 20 cases, 14, including 2 cases of well-developed septicæmia, were treated successfully. The author believes that in very toxic cases serum alone should be employed, but that otherwise the best results can be obtained with the use of serum followed after a short interval by a full dose of vaccine. WINIFRED ASHBY.

Teale, F. H., and Embleton, D.: *Studies in Infection. II. The Paths of Spread of Bacterial Exotoxins, with Special Reference to Tetanus Toxin.* *J. Path. & Bacteriol.*, 1919, xxiii, 50.

This paper is a continuation of a study of bacterial invasion and infection the first part of which was published in the Proceedings of the Royal Society of Medicine in 1914.

Following a brief review of the literature the authors record their experiments with regard to the distribution of tetanus toxin after subcutaneous and intravenous inoculation under the following headings: (1) the results of subcutaneous inoculation with tetanus toxin; and (2) the results of intravenous inoculation with tetanus toxin. They then take up the question of the spread along the neural lymphatic channels, the action of iodine on tetanus toxin, and the site of action of tetanus antitoxin. The results of the experiments are summarized as follows:

Although tetanus toxin ascended to the central nervous system by way of the axis cylinders of the nerves, it also to a very great extent passed up the nerves to the cord by way of the perineural lymphatics. Blocking of the latter paths greatly delayed, and in some cases completely prevented, the occurrence of tetanus in the part corresponding to the nerve the lymph path of which was blocked.

Although tetanus toxin passed rapidly from the blood vessels into the connective-tissue spaces and thence to the thoracic duct, it did not pass from the capillaries of the central nervous system to the tissues thereof.

Tetanus toxin did not pass from the choroidal plexus to the cerebrospinal fluid.

Bacteria passed through the posterior root ganglion to the cord, but colloidal pigments and tetanus toxin were prevented from doing so.

Although iodine kept tetanus toxin from producing its characteristic effects when the toxin was inoculated subcutaneously or intravenously, it did not affect the toxin when it was inoculated intracerebrally, did not hinder the occurrence of the typical symptoms of cerebral tetanus, and apparently did not diminish the toxicity of the toxin.

Tetanus antitoxin did not pass to the central nervous system by way of the blood vessels, axis cylinders, or neural lymphatic channels. Neither did it pass from the cerebrospinal fluid when inoculated intrathecally into the substance of the cord. The antitoxin acted simply by combining with the circulating toxin at the seat of production and preventing it from reaching the central nervous system. The toxin already there was unaffected.

G. E. BEILBY.

Wilson, W. J.: An Analysis of Seventy-Six Cases of Gas Gangrene Occurring at a Base Hospital, with Remarks on the Result of Serum Treatment. *J. Roy. Army Med. Corps*, 1919, xxxiii, 455.

After analyzing a series of 76 cases of gas gangrene the writer draws the following conclusions:

1. The serum treatment of gas gangrene in the cases studied was of doubtful benefit. It is possible that if larger doses had been given and if the serum had been injected into the affected part, the results might have been better.

2. The case mortality of gas gangrene of the upper limb was about 22 per cent while that of gas gangrene of the leg and foot was about 30 per cent. The results were similar in serum-treated and untreated cases. In gas gangrene of the thigh the mortality was 54 and 83 per cent respectively among the cases treated with and without the serum. Considering the nature of the cases and all the circumstances the difference could not be attributed solely to the use of the serum.

3. In 42 of the 76 cases the signs and symptoms of gas gangrene appeared within forty-eight hours. In 12 others they appeared on the third day. The bacillus welchii, which is the predominant infective organism in gas gangrene, was present in 74 of the 76 cases. The 2 cases in which it was absent were one case of gas gangrene appearing as a sequel to trench foot and one case of gas gangrene of the thigh in which a peculiar bacillus of the vibron septique type, the bacillus tumefaciens, was present.

The bacilli found in the 76 cases were as follows: bacillus welchii, 74; bacillus sporogenes (Metchnikoff), 41; bacillus tetani, 24; bacillus tertius, 13; vibron septique, 2; bacillus oedematiens, 2; bacillus tumefaciens, 1, and bacillus fallax, 1.

The technique employed by the author has been described in previous papers. He relies on cultural methods and believes that if he had inoculated animals he would have been more successful in isolating the vibron septique. He is satisfied, however, that only very few species of anaerobic bacteria cause gas gangrene and believes this fact would render possible the production of a serum which would be potent as a prophylactic or therapeutic agent.

H. H. FREILICH.

Jablons, B.: Gas Gangrene. *N. York M. J.*, 1919, cx, 1014.

While a multiplicity of views were expressed before and during the war as to the organism produc-

ing gas gangrene none of the findings proved either accurate or absolute.

Weinberg and Sequin who made an exhaustive analysis of the literature reached the conclusion that "a progressive gangrene infection could be due to a variety of bacteria, the clinical condition varying with the virulence of the organism, its varying ferment activity, its toxin-producing power, and other associated factors which deserve further study."

The organisms may be classified into the following well-defined groups:

1. Anaerobic bacteria which are found in connection with gas gangrene and are capable of reproducing the disease in animals.

2. Anaerobic bacteria which are isolated from gas gangrene processes, but which, although important when found with the first group, are not able alone to reproduce the disease.

3. Aerobic bacteria which are isolated from gas gangrene processes and are capable of reproducing analogous lesions.

4. Aerobic bacteria which are found in association with any of the other classes but fail themselves to produce lesions in animals.

The etiology and the factors which favor infection, particularly tissue necrosis, the combinations of organisms which prove fatal to animals, the time necessary to cause death, and the comparative toxic states are discussed in detail.

Gas gangrene is described as a progressive infection of tissue due usually to mixtures of anaerobic organisms, the pathology depending upon the types which are present. In this connection the pathologic changes in the various organs are reviewed.

In discussing the symptoms, the author contends that they differ slightly according to whether the condition is due to a toxicogenic organism, a saccharolytic organism, a proteolytic organism, or a mixture of all three. The types of gas gangrene are as follows:

A. The toxic type producing extensive necrosis and accompanied by: (1) hæmorrhagic infiltration if the blood vessel destruction is marked; and (2) oedematous infiltration if the toxin production is excessive.

B. The gas-infiltrative or classical type which is accompanied by necrosis and a variable amount of oedema.

C. The putrid type which is accompanied by marked liquefaction of the affected tissue, discoloration if hydrogen sulphide is produced, necrosis, and a variable amount of gas and oedema.

D. The mixed type in which all symptoms observed in the other types are present, but the predominant symptoms are those due to the predominant type of bacteria.

The local and general symptoms of the various types are given in more or less detail.

The clinical pathology represents the changes caused in the elements and fluids of the body by the toxins of these organisms. "The blood

count at times shows a total red blood cell count of less than 1,000,000 cells to the cubic centimeter. Ritter found in 20 cases of gas gangrene a constant diminution of the total count of the red blood cells." The urine in serious cases shows the changes due to diffuse nephritis.

The author speaks of the therapy briefly. The treatment is almost altogether surgical and early extirpation of the focus of necrotic tissue and of the anaerobic bacteria is the best means of preventing spread of the disease. "The use of prophylactic injections of mixed serum containing antibodies against the three most common anaerobes is then indicated and its use in gas gangrene has appreciably lowered the mortality."

A. R. HOLLANDER.

Kleinberg, S.: The Use of Tuberculin in the Treatment of Tubercular Bones and Joints. *J. Orthop. Surg.*, 1919, i, 722.

After a thorough and careful trial of tuberculin as a therapeutic measure in surgical tuberculosis at the Hospital for Ruptured and Crippled and in his private practice in New York the author has discarded the method. The literature concerning its use in pulmonary tuberculosis by internists, however, is rather hopeful.

In the cases here reported the so-called reactionless method was used, i.e., the tuberculin was given at first in small doses which were gradually increased but kept sufficiently small to preclude any local or general reaction.

Due care was observed to make a correct diagnosis in the beginning so that false conclusions would be avoided. Caution was exerted also in judging the outcome, since frequently the active process seems to be cured when it is only arrested for a few months. Another factor which may influence conclusions is the unusually good care received by a patient while being given the tuberculin treatment. He is seen at least twice a week and his temperature is taken probably three or four times a day. The progress of the case is carefully watched and the hygienic and dietetic measures taken approach the ideal. All these things in themselves will cause improvement, whether tuberculin is given or not, so that there should be some hesitancy in ascribing any improvement to the tuberculin alone.

It should be realized that tuberculin is often very toxic and that failures or even exacerbations and fatalities may result from improper dosage.

Thirteen cases are reported in detail, comprising tuberculosis of the spine, hip, knee, ankle, shoulder, and elbow. The criteria for judging improvement were: (1) the disappearance of muscle spasm and sensitiveness; (2) the reduction of swelling; (3) the disappearance of abscesses and sinuses; and (4) the healing of bone, as shown in the X-ray picture by increased density, ankylosis, and regular outline.

In only one case was any improvement noted. This was in a boy of 9 who had tuberculosis of the hip with numerous sinuses and ulcers. After treat-

ment with tuberculin for about a year and a half the sinuses were almost closed and he was able to walk. Even in this case, however, entire credit cannot be given to the tuberculin for autogenous vaccine was used also.

Over-confidence in the treatment is illustrated by the case of a man of 50 not under the author's immediate care. In this instance tuberculin was given for many months for tuberculosis of the knee. Resection, which was ultimately necessary, was followed by infection, amputation, and death.

The most important conclusion is that tuberculin does not cure joint tuberculosis and except in a small percentage of cases, does not appreciably benefit the lesion. Often there is a distinct aggravation of the condition with the formation of new abscesses, and even after improvement there may be a relapse.

W. A. CLARK.

EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

Barach, J. H.: The Energy Index (S.D.R. Index) of the Circulatory System. *Arch. Int. Med.*, 1919, xxiv, 509.

In the introduction to this article Barach states that in all that has been said pertaining to the measurable functions of the circulatory system, there are three well-established factors, i.e., the systolic pressure, the diastolic pressure, and the pulse rate. Very many more points than these have been proposed by various investigators, but none of the others has met with universal approval.

In this communication the author proposes the S.D.R. index which is based on the three known factors mentioned. The point of systolic pressure represents the culmination of force inaugurated by the systole of the heart, and the point of diastolic pressure the highest level of sustained pressure during the diastole of the heart. Each pulse beat consists of a systole and diastole. Irrespective of the length of time occupied by the systole and diastole, they represent together the total effort of a single pulse beat.

For example, if in a given case the lifting force of the systole is 120 mm. Hg and the diastolic force is equal to 80 mm. Hg, then the force of the pulse beat which comprises both phases is 200 mm. Hg. This multiplied by the number of beats indicates the total force per minute. These formulæ are proposed because neither the pulse rate nor the systolic pressure nor the diastolic pressure taken alone gives sufficient information. Each element of the triad is constantly changing and adjusting itself to the others, and it is the concerted action of the three forces which maintains the circulatory equilibrium. It is well known that a high systolic pressure is compensated largely by a slowing of the pulse rate, and a low diastolic pressure by an increased pulse rate, and so on, and as in the triangle of limited area, alteration in the length of one leg of the triangle necessitates a change in the other two.

His conclusions Barach states as follows:

The S.D.R. index based on the three known factors of the circulation indicates the state of activity of the circulatory system.

Normally, the index is found to be about 20,000 mm. Hg pressure per minute.

The index does not indicate "heart disease" or "decompensation" or physical fitness. It designates the amount of effort which the circulatory system is putting forth at the time.

A high index means increased cardiovascular effort. Either the action of the heart and blood vessels is accelerated because of inability to accomplish their work at a normal rate of activity, or they are fully capable of doing their work but the resistance to their functioning is great. Either condition is pathologic, and the variation of the index from the normal calls attention to this fact.

A low index means either that the circulation is accomplished with little effort or there is inability to expend the necessary effort.

Minor changes in the circulation, such as are produced by the slightest alteration in the bodily functions, the effect of drugs, etc., may be detected by the S.D.R. index.

The S.D.R. index as a guide to abnormalities in function of the cardiovascular system in a series of 26,306 cases was correct in 99.95 per cent. In cases referred for special cardiovascular examination, i.e., in the clinically doubtful cases, the S.D.R. index proved a correct guide in 78 per cent.

Of the 22 per cent of cases in which the index failed, more than three-fourths were cases of tachycardia, and in these instances it cannot be said positively that the index was wrong. G. E. BEILBY.

Hogue, M. J.: The Effect of Hypotonic and Hypertonic Solutions on Fibroblasts of the Embryonic Chick Heart in Vitro. *J. Exper. M.*, 1919, xxx, 617.

Experiments testing the effect of hypotonic and hypertonic solutions upon the growth of cells and individual cell structures have been reported more or less completely in the literature on tissue culture. The author undertook the study reported in this article to study more fully the effect of solutions of different concentration. The experiments were performed in April, May, June, and July, when the weather was at summer heat and there was consequently little danger of chilling the delicate new growths which are susceptible to sudden changes of temperature. This point is important as several investigators have stated definitely that growth is much better in the spring and summer than in the fall and winter.

The hearts of six-, seven-, eight- and nine-day chick embryos were used. The medium was a modification of Locke's solution known as the Locke-Lewis solution.

In the first series of experiments the author used Locke-Lewis solutions with a sodium chloride content of 0.54, 0.45, 0.3 and 0.225 per cent respectively,

which were made hypotonic by the addition of distilled water.

Tissue grew in the first two of these solutions and the media seemed to act as a stimulus. It did not live as long in these media as in normal Locke-Lewis solution, however, but its growth was more rapid.

The cells of normal growth were killed by treatment with hypotonic solutions with a sodium chloride content of 0.3 and 0.225 per cent respectively.

The cells absorbed much water, as did also the nucleus, which frequently formed a nuclear vacuole as an outlet for the extra amount of liquid absorbed.

Neutral red vacuoles and granules soon lost their color when the cells were treated with the hypotonic solutions that caused their death.

Mitochondria were not affected by the hypotonic solutions, but as the cell died vesicles formed at the extremities and persisted after the rest of the mitochondrion had disappeared; or the mitochondria broke up into granules or simply became more slender until only a faint, rough outline remained visible.

Hypertonic solutions were made by boiling down Locke-Lewis solution until the sodium chloride content was 1.2, 1.5, and 1.8 per cent respectively.

While tissues grew in the first two of these solutions, they did not live as long as in normal Locke-Lewis solution and their growth was slower.

The cells of normal growth were killed by treatment with hypertonic solutions with a sodium chloride content of 1.8 and 1.5 per cent.

When treated with hypertonic solutions the cells usually contracted; their thin processes became long and thread-like and were later drawn into the body of the cell. Connective-tissue fibrils formed from these thread-like processes moved and anastomosed with other fibrils. In many cells neutral red channels formed. When the death process set in the cytoplasm frequently became alveolar.

The three hypertonic solutions showed a definite gradation in their effects on the processes of the fibroblast. In Locke-Lewis solution containing 1.8 per cent sodium chloride the processes contracted rapidly, leaving many thread-like structures in their places. These were quickly withdrawn and the cell soon died. In Locke-Lewis solution containing 1.5 per cent sodium chloride the thread-like processes were formed frequently, but some of the cells recovered. In Locke-Lewis solution containing 1.2 per cent sodium chloride the processes still formed but more slowly. They also showed motion, which lasted as long as the cell was alive.

In comparing the growth in hypertonic with that in hypotonic media, the author emphasizes the following points: (1) the migration in the former was slower than in the latter; (2) in hypertonic solutions the optimum growth was reached on the third day or later, and in hypotonic solutions on the second day; (3) the growths lived longer in hypertonic solutions, but as a rule were smaller than those in hypotonic solutions. G. E. BEILBY.

Foot, N. C.: Studies on Endothelial Reactions. The Macrophages of the Loose Connective Tissue. *J. Med. Research*, 1919, xl, 353.

Foot mentions the decided advance which has been made in the study of various cells in the mammalian body due to the employment of vital stains and dyes which, administered during life and vital in the true sense of the word, may be regarded as indicators of the activity of the cells into which they become vitally incorporated.

Any one who teaches normal or pathologic histology is repeatedly confronted with the problem of explaining the identity and origin of the large mononuclear cell, endothelial cell, macrophage, clasmato-cyte, wandering connective-tissue cell, and others. Are these cells all entities, and do they represent several groups, or are they one and the same cell masquerading now under one name, now another?

It was with a view of coming to some conclusion on this point that the series of experiments here reported was undertaken. The means employed was a combination of methods which were used by other experimenters singly. Goldmann in 1909 published his first article on the action of benzidine dyes and followed this by another paper three years later. In the latter he discussed many and varied topics. Vital staining of the macrophages and the behavior of these cells in miliary tubercles, trichiniasis, and carcinoma were among the more important subjects. Foot believes, however, that our knowledge regarding the origin of the cell is still far from certain.

A series of experiments was performed by Foot on guinea pigs, mice, and a rabbit. He summarizes his findings as follows:

➤ The phagocytes, or macrophages, of the "cellular" or loose connective tissue of the rabbit were of endothelial origin.

They do not originate either in the omentum or the connective tissue cells or from lymphocytes.

They are derived probably from the proliferating vascular endothelium in the immediate vicinity of the lesion which calls them forth rather than from the vascular endothelium in general.

They do not appear to come entirely from the circulating mononuclear leucocytes, as McJunkin has suggested. G. E. BEILBY.

Ebeling, A. H.: A Strain of Connective Tissue Seven Years Old. *J. Exper. M.*, 1919, xxx, 531.

Ebeling speaks of Carrel's report on the condition of a strain of connective tissue twenty-eight months old which was isolated from a fragment of heart extirpated from a chick embryo in January, 1912. This tissue is still alive after having been under cultivation *in vitro* for over seven years and having undergone 1,390 passages. His purpose in this article is to describe the technique employed in perpetuating the strain during the last five years and in measuring the increase of the tissue, the factors which influenced the rate of growth, and the present condition of the strain.

The technique employed has not differed fundamentally from that reported by Ebeling in a previous article. The investigations and its results are summarized as follows:

A strain of connective tissue is still very active after more than seven years of life *in vitro*.

The rate of growth of the fragments of tissue was measured accurately and tests were made of the action of many different factors on the growth of connective-tissue cells.

The rate of growth is at least as rapid as it was five years ago, and perhaps more active.

Like micro-organisms, the connective-tissue cells appear to have the power of multiplying in a culture medium indefinitely. G. E. BEILBY.

Gallie, W. E., and Robertson, D. E.: The Repair of Bone. *Brit. J. Surg.*, 1919, vii, 211.

In order to investigate the truth of the generally accepted views both old and new concerning the processes of inflammation and repair in bones, the authors conducted a series of experiments on animals. The results of these experiments and clinical observations are recorded in this paper.

The studies included experiments on the periosteum, the transplantation of bone into muscle, and of autogenous, homogeneous, heterogeneous, and boiled bone grafts in living bone; studies on the changes occurring in autogenous grafts in cases of non-union and when used to bridge gaps; and studies of the plating of recent fractures and the bridging of gaps with boiled bone.

In the work on the periosteum the experiments of Macewen (1912) were reviewed and his conclusions as to the absence of osteogenetic power in the periosteum, were reaffirmed. When transplanted into muscle, bone grafts with and without a periosteal covering reacted equally in the production of new bone cells. Thus we see that osteogenesis is due to the subperiosteal osteoblasts — cells lying on the surface of the bone and in the haversian canals — rather than to the periosteum.

The authors state that not only is it unnecessary to leave the periosteum attached to the graft, but that by reflecting it and later suturing it over the gap in the bone the formation of a postoperative hæmatoma may be prevented, the normal outline of the bone restored, and the tendency of the skin to adhere to the deep structures reduced.

To observe the changes in a bone graft which must be attributed to cells of the graft itself, the graft must be placed in such a position that none of the changes can be attributed to cells derived from neighboring living cells. In the series of experiments in which autogenous grafts were placed into muscle and recovered at intervals of one, two, three, five and eight weeks respectively, a definite series of changes were noted. The bone itself died with the exception of the cells on the surface in contact with the lymph supply. These continued to live and functionate. The periosteum also lived and gradually became vascularized. The subperiosteal osteoblasts

lived and showed moderate proliferation. The earliest and most marked change, which consisted of the rapid formation of granulation tissue, was shown by the endosteal surface. The dead bone was absorbed by osteoblasts and replaced in response to Wolff's law.

In the transplantation of heterogeneous bone into muscle the bone graft died and the circulation was slowly re-established. In no case up to eight weeks were osteoblasts found. Those of the graft were killed by the fluids of the other animal.

The results of experiments in which boiled bone was transplanted into muscle closely paralleled those obtained when heterogeneous bone was used. Absorption, however, was somewhat delayed.

When the bone was placed in contact with living bone the processes of absorption and replacement were similar to those which occur in grafts placed in muscle, but more rapid. There was a marked formation of granulation tissue, especially on the medullary side of the living bone bed, and it was evident that most of the new cells came from the living bone and not from the graft. Firm union had resulted in two weeks. In similar experiments with heterogeneous and boiled bone absorption and replacement were delayed. Firm union did not occur until the third week.

Experiments in bridging gaps in bone showed that the portion of the graft in contact with living bone was replaced earlier than the portion forming the bridge. The process of absorption was accomplished before that of replacement and at about the fifth week the graft was very fragile.

In using boiled bone to bridge short gaps the results at five weeks were indistinguishable from those observed when autogenous bone grafts were used. In a long bridge, however, the osteoblasts from the living bone did not penetrate far enough and the middle portion was gradually absorbed and replaced only by fibrous tissue.

In the experiments two factors seemed chiefly responsible for non-union. These were lack of fixation and lack of sufficient apposition of the graft and fragments.

Of the four methods of implanting grafts in common use, the inlay method has been most successful in the hands of the authors. The intermedullary method is successful but can be used only when the gap is of considerable size. In many cases the external plate is successful. The chief objection to the latter is that no use is made of the endosteal layer of the fragments from which most of the osteogenic cells come. When the fragments are small the wedge method is of value.

In comparing the value of homogeneous grafts in dogs with autogenous grafts as controls no difference in the amount of reaction could be determined at the end of three and one-half weeks. The recent work on skin grafting by Masson suggests that when it is necessary to use homogeneous grafts in man the compatibility of blood as shown by the agglutination test should be taken as a guide.

Boiled bone plates and screws used for the fixation of recent fractures were very successful. In the experiments no dead bone was present at the end of eight months.

Experience has shown that sepsis is fatal to bone grafts.

J. I. MITCHELL.

De Gaulejac and Nathan: The Restoration of Spongy Tissue in the Neighborhood of Traumatic Hæmatomata; the Fertile Element of the Diaphyseal Parenchyma and Its Part in Bone Restoration (La restauration du tissu spongieux au voisinage des hématomes traumatiques; l'élément fertile du parenchyme diaphysaire; son rôle dans la restauration osseuse). *Rev. de chir., Par.*, 1919, lvii, 250; 264.

From their experimental research on dogs regarding the phenomena of bone regeneration the authors make the following conclusions:

1. Bone may be repaired at the expense of the fibrous tissues the collagen of which is transformed into pre-osseous substance under the influence of the surrounding bone tissue.

2. The method of ossification varies according to the structure of the connective tissue which serves as a substratum.

3. Periosteum in no way differs from ordinary connective tissue.

4. Connective tissue therefore may be used in the vicinity to fill all bone losses and to insure their rapid and integral restoration.

5. Compact bone has a fertile bed which is its middle layer or the layer in which are the haversian canals.

6. This osseous bed reacts to all traumatism or inflammations by a more or less complete return to the state of indifference.

7. This reaction, appreciable to radiography, shows the following histologic characteristics: enlargement of the haversian canals, separation of the bone lamellæ, and diminution in the affinity of the bone substances.

8. When its external limit is destroyed, the middle bed is capable of proliferating into the surrounding connective tissues if it is intact or only slightly damaged. Hyperostosis becomes an exostosis.

9. The anatomical processes can be reproduced experimentally.

10. The repair of bone tissue by means of the connective tissue deserves a place in surgical technique.

11. The limiting external layer represents an arresting system interposed between the middle bone bed and the surrounding connective tissues.

W. A. BRENNAN.

Ely, L. W.: Experimental Resection of the Dog's Knee Joint. *Ann. Surg.*, 1919, lxx, 586.

In order to demonstrate the methods of repair after a break in the continuity of the shaft of a bone, the author undertook a very extensive series of experimental resections of the knee joint in the dog.

The time allowed to elapse before examining the results of these operations varied from fourteen days to three years and one week.

The resections varied in the amount of bone removed, and in some instances a mortise was made. The results of these experiments would seem to indicate that the less bone removed the greater the likelihood that a new joint may be constructed. It should be remembered that in the dog absolute immobilization is impossible. In cases in which much bone was removed it is probable that the line of resection passed through the bone at a level where it was covered by periosteum. In the region of the joint periosteum is not present. It is not possible therefore to obtain a so-called "wiped joint" which is usually essential to bony union. In resections of the knee in man, bony union usually results after a year or so, but in some joints, such as the elbow and the ankle, more than a fibrous union almost never occurs. In the mortise operations on the dog, in which the shape of the bone ends was radically changed, better immobilization was obtained and a bony union occurred.

Whitman has partially answered the question as to the cause of non-union after fracture of the femoral neck by maintaining that faulty apposition and immobilization are at the bottom of the difficulty. If good apposition is maintained and immobilization is continued for a sufficient period of time, bony union will probably occur in spite of the absence of periosteum.

GATEWOOD.

Morris, D. H., and Bullock, F. D.: The Importance of the Spleen in Resistance to Infection. *Ann. Surg.*, 1919, lxx, 513.

The authors report the results obtained in several series of experiments with rats undertaken for the purpose of arriving at a conclusion regarding the importance of the spleen in resistance to infection.

Four series of experiments were carried out on large numbers of white and brindle rats. Half of the rats in each series were splenectomized and half were castrated by laparotomy. The first two series were then exposed to chance laboratory infection of rat plague. In the first series 80.5 per cent of the splenectomized rats died as compared with 38.9 per cent of the controls. Necropsy showed congestion and parenchymatous degeneration of nearly all the important organs and as a rule the bacillus of rat plague was found in the heart's blood. Similar results were obtained in the second series.

In the third series, immediately following splenectomy and orchidectomy, a sublethal dose of a broth-culture of the bacillus of rat plague was injected into each animal. The mortality of the splenectomized rats was 87.5 per cent while that of the castrated group was 22.7 per cent.

In the fourth series of experiments the procedure followed was the same but the rats were all older. The mortality in the splenectomized group was 87.5 per cent as against 12.5 per cent in the castrated animals.

The authors conclude that while animals may get along fairly well without the spleen in the absence of infection, the reverse holds true when the body is put to the strain of resisting acute bacterial invasion, and that therefore the spleen aids tremendously in resisting infection. Accordingly it may be reasonably inferred that when the human body is deprived of the spleen its susceptibility to infection is increased, an assumption which readily explains some of the fatalities attributed to infection following splenectomy.

P. M. CHASE.

Pearce, L., and Brown, W. H.: Chemotherapy of Trypanosome and Spirochæte Infections. II. The Therapeutic Action of N-Phenylglycine-amide-P-Arsonic Acid in Experimental Trypanosomiasis of Mice, Rats, and Guinea Pigs. *J. Exper. M.*, 1919, xxx, 437.

In experimental trypanosomiasis of laboratory animals N-phenylglycineamide-p-arsonic acid exercises a powerful therapeutic effect. As it occurs in mice and rats trypanosomiasis is characterized chiefly by the constant and progressively increasing number of trypanosomes in the peripheral blood stream, the absence of clinical manifestations, and the relatively early death of the infected animal. An effective therapeutic compound for the treatment of trypanosomiasis in these animals, therefore, must be biologically available within a very short time after its administration and must have a sufficient speed and duration of action to halt and eventually overcome a rapidly increasing blood infection comparable, in part, to a bacteræmia which if not checked will cause death in a few days or even a few hours. On the other hand, in many of the larger animals, especially the rabbit, trypanosomiasis is preeminently a tissue infection and in the acute stages is characterized by conspicuous oedematous and inflammatory swellings of the soft parts, particularly of the head and external genitalia, with loss of appetite, weakness, and emaciation, and in the more chronic stages by induration of the inflammatory lesions and even necrosis with involvement of the deeper tissues including the periosteum and bone. The duration of the infection in rabbits is a matter of weeks or months and the presence or absence of trypanosomes in the blood stream is distinctly of minor importance. It is obvious, accordingly, that a drug which is used for the treatment of this type of infection must possess, in addition to trypanocidal action, the power of penetrating disease tissue, and since this may require a considerable amount of time, the drug must remain biologically active in the animal host as long as may be necessary.

In order to arrive at a full appreciation of the therapeutic action of a drug in experimental trypanosomiasis, therefore, we have, from the point of view of the animal factor, two general types of infection the treatment of which will furnish information as to the speed of action of the drug on the one hand, and the duration of its action or potency on the other. This information should include such

data as the determination of the therapeutic range in different animal species, the curative dose, the therapeutic action against different species of trypanosomes, the comparative value of different routes of administration, the results of a repeated dose system of therapy, and the toxicological and pathological action of the drug in various animal species. It will then furnish a logical foundation for an accurate appraisal of the action of the drug under experimental laboratory conditions and at the same time establish a basis for estimating its probable value in the treatment of trypanosomal infections as they occur in nature.

The article reviewed includes the therapeutic results obtained with the amide of N-phenylglycine-p-arsonic acid in experimental trypanosomiasis. While, strictly speaking, trypanosomiasis of the guinea pig is a chronic infection of cyclic character, the results of its treatment with the drug are incorporated with those obtained in the treatment of acute infections of mice and rats. On the basis of these experiments the authors draw the following conclusions:

N-phenylglycineamide-p-arsonic acid is an agent of marked therapeutic action in the treatment of experimental trypanosomiasis of mice, rats, and guinea pigs. It possesses an average curative range of from 0.2 to 0.3 gram per kilo of body weight of the sodium salt against a twenty-four hour infection in mice and rats produced by several species of pathogenic trypanosomes. Since the lethal dose for mice is from 2 to 2.25 grams and for rats 0.75 gram per kilo of body weight, we have curative ratios of 1:8 and 1:3 gram respectively. The curative dose for guinea pigs is 0.15 gram per kilo of body weight, thus giving a curative ratio of 1:10. The trypanocidal activity of the compound is relatively rapid in all three animal species for the peripheral blood is cleared of organisms within twenty-four hours after its administration, and in addition, the lower limits of the curative range are comparatively sharply defined. For all practical purposes, the intraperitoneal, intravenous, and subcutaneous routes of administration may be considered equally efficacious.

G. E. BEILBY.

Barbour, H. G., and Devenis, M. M.: Antipyretics. II. Acetylsalicylic Acid and Heat Regulation in Normal Individuals. *Arch. Int. Med.*, 1919, xxiv, 617.

Although acetylsalicylic acid (aspirin), introduced into therapeutics by Dreser, is today the most widely used of antipyretic drugs, its action on the heat-regulating mechanism has not received either the careful or the extensive study it deserves. That other salicylates possess antipyretic and analgesic properties of a more feeble order than those of acetylsalicylic acid was emphasized by the work of Bondi and Katz who associated the difference with the fact that the acetyl ester appears to be absorbed and distributed largely intact while the salicylate is but slowly split off in the intestine.

In this paper the authors deal with the effects of acetylsalicylic acid on the heat regulation of normal human subjects. Five normal persons served as subjects, three medical students and the authors. The findings in the experiments carried out were as follows:

Normal persons usually responded to acetylsalicylic acid (1 gm. per os) by an increase in the carbon dioxide output and heat production. The maximum effect was reached during the fourth half hour after administration.

The average heat production of the five subjects was 40.3 calories per square meter per hour after the drug was taken, in contrast to the basal average for the same persons of 37.8 calories. The increase therefore amounted to 6.1 per cent.

In spite of the increased metabolism, heat dissipation was not significantly altered.

During the control experiments the average change in body temperature was -0.08°C ; after the drug it was $+0.03^{\circ}\text{C}$.

The respiratory quotient and the pulse rate did not appear to be altered by the drug, and sleep did not seem to favor the exhibition of any antipyretic action by the acetylsalicylic acid.

G. E. BEILBY.

Barbour, H. G.: Antipyretics. III. Acetylsalicylic Acid and Heat Regulation in Fever Cases. *Arch. Int. Med.*, 1919, xxiv, 624.

In a previous paper the author showed that acetylsalicylic acid in 1 gm. doses has but a slight effect on the heat balance of normal persons. The average increase above the normal heat production obtained in five cases was 6.1 per cent, the maximum effect occurring during the fourth half hour after the drug was taken by mouth. The rise in the body temperature was very slight.

In this paper Barbour reports the effects of acetylsalicylic acid given in the same amounts in fever cases. During febrile and afebrile phases, as well as in the first stages of convalescence, the phenomena manifested were similar.

In determining the means by which a substance exerts its antipyretic action, it is necessary to know how the energy exchange is affected and whether the reduction in temperature is due to an increase in heat elimination or a decrease in heat production, or both.

The author gives the method and results of these experiments which were also carried out on five subjects, and summarizes his results as follows:

Acetylsalicylic acid in 1 gm. doses exhibited a marked antipyretic effect in febrile, temporarily afebrile, and convalescent subjects.

In one and one-half hours the temperature change averaged -0.81°C . in six experiments on four persons in contrast to an average rise of 0.18°C . on four control days.

In the control experiments the heat elimination averaged 37.7 calories per square meter per hour. When acetylsalicylic acid was given it became 52.1

calories, an increase of 38.2 per cent. The antipyretic effect was due essentially to this change which was associated with marked perspiration and subjective warmth.

The fall in temperature was accompanied by a heat production of 38.8 calories per square meter per hour, a decrease of 3.5 per cent below the 40.2 calories of the control days. This change was due probably to the cooling of the body.

In the pulse rate the drug caused an averaged decrease of ten beats per minute. Temporary cardiac disturbances were noted in two cases.

The return to the initial temperature level was brought about essentially by a reduction of the heat elimination to about one half the normal figure and was unaccompanied by shivering or marked increase in the carbon dioxide output.

The sensitivity of febrile, temporarily afebrile, and convalescent subjects to antipyretics was not explained. These drugs did not "stimulate" a "depressed" heat regulating mechanism, nor was the sensitivity due to a lack of readily combustible material (dextrose). On the other hand, the respiratory quotient of persons sensitive to antipyretics appeared to be increased by doses of acetylsalicylic acid which did not affect the quotient of normal persons. The author hopes to elucidate this question of sensitivity by further studies of the carbohydrate metabolism.

G. E. BEILBY.

Park, E. A., and McClure, R. D.: The Results of Thymus Extirpation in the Dog, with a Review of the Experimental Literature on Thymus Extirpation. *Am. J. Dis. Child.*, 1919, xviii, 317.

The experiments described in this paper were undertaken by the authors after reading reports of the results of thymus extirpation by Klose and Vogt and by Matti and in the belief that it might be possible in this way to produce a condition closely related to, if not actually identical with, rickets in man.

To the reports of their experiments they have added also a description of the development of the thymus in the higher mammals in order to make plain the differences in the anatomical arrangement of the thymus in the species which have been used for thymectomy experiments most commonly and to make clear the variations which often have been found in different members of the same species.

In supplementing their own work with the historical and developmental studies mentioned their purpose has been also to obtain more than a mere orientation of ideas in regard to the results of experimental extirpation of the thymus; they have sought to indicate the parts of the thymus problem which require further investigation and the lines of approach which offer possibilities of success.

The article under consideration is limited in its scope to a consideration of the removal of the thymus gland and its effects upon animals, and does not go into the question of the histogenesis of the thymus, its pathology, its rôle in clinical medicine,

or the effects produced on the thymus by the removal of the various endocrine glands.

The results of their experiments the authors summarize as follows:

Extirpation of the thymus failed to cause death. It did not produce rickets or any disease of the skeleton. It was impossible, in fact, to be certain that it caused any alteration in the animal. A great minority of experiments suggested the possibility that removal of the thymus retarded or diminished the growth of the skeleton, and therefore of the animal as a whole, while some of them indicated that it had provoked changes resembling hyperplasia in the thyroid and hypertrophy of the suprarenal, or had retarded the development of the testes. These changes, however, were actually due to some other cause than deprivation of thymus function because they did not occur in combination in the same animals.

As a result of their experiments the authors found it possible to draw some general conclusions in regard to the function of the thymus in the dog. Thymus function they found to be absolutely unessential to life and not necessary for the normal process of ossification. It is not required for the normal growth and development of the hair, teeth, or muscles or for normal intelligence. They point out, however, that even if there had not been any change in any of the organs of internal secretion in the experimental animals it would still have been impossible to state that the destruction of thymus function did not produce any changes for the reason that their investigations did not cover the period which immediately followed thymectomy. Changes might have been present in the endocrine glands of the thymectomized dogs of their experiments which had vanished completely or had been reduced to mere traces by the time the organs were examined. Attention has never been directed to the possibility that the period immediately following thymectomy may be that in which alterations in the endocrine glands are best developed or may be the only one in which they are present. All investigators have awaited the development of symptoms of thymus insufficiency in the living animal.

In attempting to explain the positive findings of other investigators, the authors hazard the opinion that ultimately it will be generally accepted that the changes ascribed by many investigators and perhaps by all to deprivation of thymus function have nothing to do with loss of thymus function but are the result of chance variations, confinement, other unfavorable environmental influences, unsuitable food, or disease on animals whose vitality already has been lowered by the shock of a severe operation.

The authors have previously indicated that many of those who have reported characteristic changes in the living animal after thymectomy or in the skeleton or organs after death seemed to have proceeded from the assumption that all deviation from the standards set by the control animals was necessarily

the result of deprivation of thymus function and that the operation of thymectomy was a factor altogether negligible which did not render the thymectomized animal any more susceptible to disease than the normal animal or any less resistant to a variety of injurious influences. They have pointed out also that no two animals are exactly alike in size or form or the morphology of the internal organs, even though they are of the same litter and of selected stock, and hence chance variations are bound to appear. Further, in the offspring of mongrel stock—such as has been used by all investigators without exception—normal variation has extremely wide limits. They have indicated also that the operation itself was always the cause of temporary retardation in growth or development through the entrance of infection, the existence of which might never be recognized. They have endeavored, in addition, to make clear that the animal confined in a cage or cellar while still in a weakened condition resulting from the operation, or given unsuitable food, or infected with mange or round worms or distemper may be unable to rally and so remains feeble and retarded in growth and development, and perhaps finally dies while the control animal remains unequally affected or is not affected at all. They consider it absurd to suppose that ten animals in which the thorax was opened when they were a few days old and a large structure dissected from the beating heart and the nerve trunks and vessels of the thorax and neck should all grow as rapidly and thrive as well, once they had survived the immediate danger to life, as animals which had remained untouched, and that the ultimate mortality in the one group should not be greater than in the other.

Experimental results such as those obtained in the rabbit by Lucien and Parisot, or by Bash in the dog, consisting essentially in temporary retardation of growth, could be most naturally and simply explained, in the authors' opinion, as the direct or indirect effects of the operation or of the operation and confinement. Experimental results like those of Tarulli and Lo Monaco, Cozzolino and Fulci, in which one or two thymectomized animals out of a group failed to grow at the normal rate and developed skeletal changes of one sort or another, are susceptible to interpretation on the ground that the one or two animals whose powers of resistance had been most reduced by the operation were the ones least able to throw off infection or withstand environmental conditions or disease. Doubtless the positive findings of the experiments of Matti and Klose, in which a considerable proportion of the thymectomized dogs were affected and finally died, are explicable on the same general principles. It is not asserted, however, that none of the positive experimental results after thymectomy reported by other workers could have been due to deprivation of thymus function, it being merely pointed out that there are other explanations than deprivation of thymus function for the symptoms and pathologic changes in thymectomized animals which have been

reported, that these explanations must be seriously considered in the interpretation of all positive experimental findings, and that for the interpretation of the positive experimental findings reported by some investigators these explanations become absolutely essential.

In evaluating the results obtained by thymus extirpation the greatest importance must be ascribed to the fact that the symptoms and pathologic changes attributed to deprivation of thymus function are almost without exception the symptoms and pathologic changes which occur in laboratory animals as the result of confinement, improper food, unhygienic conditions, and bacterial and parasitic infections, and are identical with or closely related to those which have been reported after the removal of at least two organs of internal secretion in addition to the thymus, excision of the carotid bodies, and a number of different abdominal operations.

On the basis of their own experiences the authors make certain suggestions in regard to the experimental work in thymus extirpation which may be undertaken in the future. They believe that it is certain that extirpation of the thymus does not produce death or the development of rickets. They conclude, however, that the question of the influence of thymus extirpation on growth and development and on certain of the organs of internal secretion, notably the thyroid, testis, and suprarenal, is not settled. For the study of the effects on growth and development they suggest that only thoroughbred stock, standardized in point of size, be used, that each thymectomized animal have his own control animal of the same sex and of the same litter, and that the animals be not confined nor placed in large groups, but kept under conditions which are absolutely natural for that particular species of animal. They believe that the problem of the effects of thymectomy on growth and development can never be solved unless the experimental conditions mentioned are complied with rigidly.

For the determination of the effects of thymectomy on the organs of internal secretion they suggest that studies of the organs of internal secretion be made in the first few weeks which follow thymectomy as well as at a later period, that each thymectomized animal have his own control animal of the same sex, and that the conditions under which the animals are placed be normal. Further, they urge that the completeness of the thymectomy be judged solely by the experience of the operator at the time of operation and by the results of the most careful examination of the animal at necropsy for thymus rests, and that all experiments in which there is every evidence that the thymus was completely extirpated be regarded as valid, whether the results happen to meet the preconceived ideas of the investigator or not. They believe that positive conclusions in regard to these effects of thymectomy should be drawn only from evidence which is overwhelming.

G. E. BEILBY.

Matronola, G.: Experimental Research upon the Thymic Theory of Basedow's Disease (Ricerche sperimentali sulla teoria timica del morbo di Basedow). *Clin. chir.*, 1919, xxvi, 865.

The author reviews the various theories as to the cause of Basedow's disease and reports the details of 14 experimental investigations on dogs in which he endeavored to determine whether hyperthymization would cause the appearance of Basedow symptoms. The results of these experiments are summed up as follows:

1. The thymus grafts did not take in any sense; perhaps the entire thymus rather than pieces should be employed or the experiments should be performed on puppies rather than on adult dogs. The glandular tissue rapidly degenerated beginning with the disappearance of Hassall's corpuscles. Simultaneously the host tissues circumscribed it with a connective capsule from which septa spread and became interwoven among the thymic lobules which they absorbed by degrees until finally nothing of the graft was left but a scar.

2. During the period of absorption the weight of the animals did not undergo any notable alteration beyond the normal.

3. The pulse seemed almost constantly increased during the first days following operation.

4. A leucopenia was never observed nor any lymphocytosis, but frequently there was a slight increase in the number of neutrophile leucocytes.

5. Large heterogeneous thymus grafts were better tolerated if inserted in the omentum than if inserted subcutaneously. In 2 cases in which they were inserted subcutaneously the animals died a few days after operation. This was perhaps due to the fact that the site being badly irrigated, the grafted pieces rapidly disintegrated and a large quantity of toxic matter was rapidly absorbed.

6. Histologic changes in the thyroid suggested hyperfunctioning and hypertrophy.

In support of the thymic theory of Basedow's disease there was only the simple transitory increase in the number of pulsations and a slight thyroid hypertrophy. It is possible of course that the hyperthymization was insufficient and the animals were far from the condition present in thymic hypertrophy. The grafts did not take and hence there was only the resorption of the small quantity of thymus secretion contained in the gland and of the organic products of the dead tissue.

The method used is therefore useless and further experiments should be performed in such a way that the animal will obtain repeatedly and continually a quantity of thymic juice sufficient to produce a constant state of hyperthymization. Following attempts made in this way the symptoms might be more evident and perhaps develop a picture similar to that of Basedow's disease. Perhaps it might be better to inject into the animals repeated doses of thymus autolysate. So far as the author knows this method has not yet been experimentally tried.

W. A. BRENNAN.

ROENTGENOLOGY AND RADIUM THERAPY

Macleod, N.: Experiments on the Detection of Pus-Soaked Cloth in Animal Tissues. *Arch. Radiol. & Electrotherapy*, 1919, xxiv, 192.

These experiments were made by embedding a sac of sausage skin containing pus and a piece of pus-soaked cloth in a mass of fresh beef and then injecting an emulsion of bismuth salt into the sac through a wooden tube tied into its mouth. It was found that when the mass of the injected emulsion was not too thick the markings of the cloth could easily be shown by roentgenographic examination. The author arrived at the following conclusions:

1. No attempt should be made to inject fresh wounds with bismuth or other substance for radiographic purposes.

2. After injecting as much of an emulsion of 1 part of bismuth salt to 3, 4, 5, or 6 parts of mucilage of acacia as can be introduced, plug the opening and gently knead the area under suspicion, if this is possible, and mix the emulsion and pus thoroughly before making the radiograph.

3. If the presence of cloth is suspected remove the plug and drain away the injection by gentle hand pressure at right angles to the plate before making the radiograph, in order to flatten the cloth and reduce the emulsion mass.

4. The slight extra effort thus involved in the radiographic examination of fistulæ containing pus-soaked cloth will be amply rewarded if the cloth is detected three times out of four as was the case in the last twelve of the experiments reported.

5. Stereoscopic negatives should be made invariably in such cases if operating surgeons with binocular vision are to have all the assistance the radiographer can give them.

ADOLPH HARTUNG.

Diamond, J. S.: The Roentgen Diagnosis of Diseases of the Thoracic Viscera. *Med. Rec.* 1919, xcvi, 873.

The roentgen ray will record tissue changes before they are discernible by other methods. The importance of clinical study of individual cases, however, should not be minimized for while there may be roentgen-ray or physical signs of tuberculosis before the patient manifests any sign of tuberculous toxæmia the final interpretation rests upon clinical studies.

It is always advisable to follow a certain routine in the roentgen-ray examination of the chest, noting the type of thorax, the width or variation of the interspaces, the diaphragmatic domes and their excursion, the illumination of the cardiophrenic angles, etc. The author describes in detail also the normal anatomy of the thoracic viscera as depicted in roentgenograms.

In discussing pathologic conditions Diamond contrasts bronchopneumonia, which spreads from the hilus outward with densities more or less isolated and areas of aeration shining through, with lobar pneumonia in which consolidation begins at the

periphery and spreads *en masse* toward the hilus. Formerly when the presence of pneumonia could not be determined by the ear it was thought to be central and therefore inaccessible to auscultation. As a matter of fact, however, the exudates are cortical and the reason their vibrations are not transmitted to the ear is because they have not reached the larger bronchi.

Pleural effusion casts a dense shadow in which there is total disappearance of lung markings; if large, the mediastinal contents are displaced and the upper level of the fluid assumes a concave line reaching higher at the periphery. If air is present (pneumothorax) the level of the fluid is straight.

Tuberculosis may be confined to the hilus and appear as an infiltration of the glands. In such cases it causes distortion of the natural outline of the hilus and, when extreme, throws the shadow of a dense mass. A similar picture is seen in many other diseases, including Hodgkin's disease and syphilis. The hilus is always more or less affected before tubercles are visible in the parenchyma. Often the process stops here, the glands becoming later inspissated with lime salts. When it does not stop here the tubercle forms in the smallest and most distant bronchioles. It is seen as an irregular small area of increased density and is spoken of as peribronchial infiltration. The blocking of the lymphatics adds to the engorgement and increases the prominence of the markings. The apex of the lung may show reduced illumination. A diagnosis of pulmonary tuberculosis cannot be made unless peribronchial infiltrations are seen. Congestion may be caused by other factors and the reduced illumination may be due to old thickened pleura. Some enlargement of the hilus with the presence of calcified glands is frequently found in healthy persons. Healing processes such as fibrosis and calcification are very distinct in roentgen plates.

The acute miliary type of tuberculosis is seen as small discrete, punctate densities scattered from apex to base, usually in both lungs.

Pneumoconiosis is the result of irritative changes in the lungs due to the inhalation of dust. In time, a characteristic mottling becomes evident. At a certain stage it is often difficult to differentiate this disease from tuberculosis; it does not begin in the apices, however, and its distribution is usually symmetrical.

Cylindrical, fusiform, or sacculated bronchiectasis is recognized by characteristic areas of increased illumination usually in the lower lobes.

Malignant tumors are usually secondary. Sarcomata are easily recognized as rounded dense masses which generally are well defined. Carcinomata, which are more difficult to recognize, appear as small dense areas in the interstitial tissue of the lung and along the larger trunks. When secondary they are seen in both lungs.

Roentgen-ray examination of the heart has become both accurate and simple and often gives conclusive findings when percussion has failed. The

size of the heart can be determined accurately by plates made at a distance of 6 ft.—teleroentgenograms. The outline of the diseased heart grossly considered assumes one of two distinct shapes, spherical or oval. The first is seen in cases of mitral lesions; the second, in aortic lesions. In mitral stenosis the left auriculopulmonic curve bulges while the aortic arch recedes. In mitral insufficiency the left ventricle also enlarges. In aortic lesions the aortic arch becomes widened, the auriculopulmonic curve is more accentuated, there is a very marked increase in the size of the left ventricle, and the heart assumes an oval shape.

Pericardial effusion causes an increase in the size of the heart shadow and gives it a triangular shape. In this condition also there is loss of pulsation.

Aortic aneurism is distinguished from other mediastinal tumors by its expansile pulsation. This diagnosis, needless to say, is conclusive.

Concluding his general résumé Diamond calls attention to the fact that while in some instances roentgen-ray diagnosis is conclusive, in others it is but corroborative and conclusions can not be reached without the aid of clinical manifestations. It is for this reason that the roentgenologist should have clinical acumen and it behooves the clinician to familiarize himself with the roentgen appearance of pathologic states.

D. R. BOWEN.

Groover, T. A., and Christie, A. C.: An Analysis of 1,300 Cases Referred for Gastro-Intestinal Study, with Special Reference to the Importance of Chest Examination of Such Cases. *Am. J. Roentgenol.*, 1919, n. s. vi, 571.

To emphasize the fact that gastro-intestinal symptoms frequently have their source in lesions above the diaphragm, the authors analyzed 1,300 cases examined by them during the past two years. Of this number, 506 showed actual pathologic conditions and in 170 of these there were lesions in the chest. In other words, the gastro-intestinal lesions were only about twice as numerous as the chest lesions in cases referred for gastro-intestinal study. Pulmonary disease was found in 98 cases and in 84 of these the lung condition was tuberculosis. Sixty-nine cases belonged to the cardiovascular group and 3 were cases of intrathoracic goiter. Coincident lesions of the lung and gastro-intestinal tract were noted in only 6 cases, whereas coincident lesions of the lung and cardiovascular tract were found in 11. Special emphasis is laid upon the need for stereoscopic plates in chest examinations in addition to the fluoroscopic examination. ADOLPH HARTUNG.

Metcalfe, J.: Stereoscopic Radiography in the Treatment of Fractures of the Femur. *Proc. Roy. Soc. Med., Lond.*, 1919, xii, Sect. Electrotherap., 72.

Stereoscopic radiography in the treatment of fractures of the femur produced uniformly better results than the ordinary methods. A special bed was used to facilitate the examination and frequent

exposures were made. The information thus obtained served as a guide for proper corrective measures. As a result most cases showed very little shortening and no after-stiffness of the knee joint. The author believes that the examination of reduced stereoscopic prints shows the appearance and contour of the bone much better than the large plates in a Wheatstone or similar stereoscopic device.

ADOLPH HARTUNG.

Thompson, H. B.: Osteomyelitis and Its Classification Radiographically. *Northwest Med.*, 1919, xviii, 270.

The roentgenologist's report of a case of osteomyelitis should aim to give not only information as to diagnosis but also such data concerning the origin, extent, probable virulence and prognosis of the condition, both with and without operation, as may be gathered from a careful study of the roentgenogram. The author classifies the disease according to its origin into the medullary, cortical, and periosteal type.

The medullary type corresponds to the idiopathic, acute osteomyelitis of the old classification and occurs, as is usual among virulent infections, in a restricted space. In this connection operation should not await X-ray findings unless a diagnosis cannot be established without them.

The cortical type corresponds to the chronic form of the old classification. It is due to some low-grade infection and usually follows an injury. It tends to remain localized, produces less bone destruction and more bone production, and therefore gives a much better prognosis.

The periosteal type can be diagnosed radiographically only after some weeks, when it usually affects the cortex secondarily. It gives a preponderance of bone production over bone destruction, usually follows an injury, and is very often specific in character.

Roentgen findings relative to the detection of sequestration are given, as is also the differential diagnosis between osteomyelitis and such lesions as bone cysts, ossifying hæmatomata, myositis ossificans, malignancies, and Paget's disease.

ADOLPH HARTUNG.

Morrow, H., and Lee, A. W.: Radium in Dermatology. *J. Am. M. Ass.*, 1919, lxxiii, 1523.

This is a summary of three years' experience in the treatment of certain forms of skin diseases with radium. Varying quantities and different types of containers were used according to the particular lesion. Practically all cases were treated by more or less direct juxta-position of the radium with intervening screens of several types.

The best results were obtained in cases of true basal-cell epithelioma. Eighty-nine of 112 cases of this nature cleared up without recurrences. In 15 there were recurrences which cleared again following further radium treatment. Bowen's type of epithelioma also showed uniformly good

results. With squamous-cell carcinoma the authors have had limited experience as most of the patients with this type of growth were referred for surgical treatment. A few inoperable cases, however, were favorably influenced. Only a few sarcomata were treated, but the results obtained were more satisfactory than in any other form of malignant disease except basal-cell epithelioma.

Of various nævi treated, the so-called strawberry mark or cavernous angioma showed the most decided improvement, disappearing entirely after a few applications and leaving a scar almost like the normal skin. Horny or warty linear nævi as well as pigmentary nævi were successfully removed. The angioma simplex or port-wine marks gave less satisfactory results. Warts could be readily removed, but other forms of treatment are probably to be preferred except for plantar warts and those which occur at the side of or under the finger nail. In cases of the latter type the results left nothing to be desired.

In the majority of instances of keloid excellent results followed the treatment, especially if the lesion was of recent origin and appeared in young subjects. For the discoid and the red, scaly, thickened areas of erythematous lupus, radium was found of value. Beneficial effects were obtained also in the treatment of myxomatous cysts on the dorsal and lateral aspects of the distal phalanges. In addition, a small number of cases of lupus vulgaris, leukoplakia, and pruritus ani were treated successfully.

ADOLPH HARTUNG.

MILITARY SURGERY

Jones, R.: A Few Surgical Lessons of the War. *Brit. M. J.*, 1919, ii, 587.

In nerve injuries no interval between the injury and operation is too long to preclude possible recovery after treatment. In the majority of cases the end-results are dependent on the condition of the muscles, tendons, and joints. Complications such as septic wounds involving the bones, muscles, and tendons, and stiffness of the joints necessitate delaying surgical procedure.

Early operation is desirable not because delay in operating on the nerve lessens its chances of regeneration, but because long-standing infection and contracture seriously impair the ability of the muscle to react when the nerve path is re-established.

Spontaneous regeneration should not be awaited for more than two months. An exploratory operation requires a surgeon experienced in nerve surgery. The wound should be closed without interference if the sheath of the nerve is intact and the nerve gives a faradic response when tested with a weak current.

Nerve grafting, bridging with catgut or other foreign material, the turning down of nerve flaps, nerve crossing and anastomoses are all invariably failures. End-to-end suture is the only method by which satisfactory results are obtained.

End-to-end approximation can be obtained in the majority of cases by posturing the joints and transposing the nerves. One and one-half inches can be gained by transposing the musculospiral nerve to the inner side of the humerus, and several inches by transposing the ulnar to the front of the elbow.

Scar tissue should be excised if possible. When nerve protection is necessary, a living muscle flap is indicated as nothing is to be gained by surrounding the suture line with Cargile membrane or vein or fat transplants.

In cases of irreparable nerve damage tendon transplantations properly carried out are very satisfactory. The prognosis with regard to functional utility depends both upon the nerve injured and the patient's occupation.

In cases of musculospiral, sciatic, and brachial plexus lesions good recoveries are generally obtained. In ulnar and median nerve lesions the results are not so satisfactory as often there is interference with the finer movements of the hands.

Regarding gunshot fractures of the femur the author states that in 1916 the mortality was about 80 per cent. In 1918 this high mortality was reduced to 20 per cent by the use of the Thomas splint. The Thomas splint adequately mobilizes the fracture, minimizes the resulting shock, simpli-

fies transportation, and gives the most satisfactory end-results. In 300 cases of compound fracture the average shortening was $\frac{1}{2}$ in.

The most common cause of non-union in fractures was loss of bone substance. Esquiectomy, which at times is necessary, accounts for many gaps which do not fill in.

In the later stages of treatment it was noticed that a number of fragments removed showed considerable osteogenetic power and this led to the practice of maintaining the length of the limb rather than approximating the bone ends. Gaps which exhibited only faint X-ray shadows ultimately filled with bone.

In restoring function to joints forcible movements are rarely indicated. If in cases of joint injuries the pain which may occur after manipulation is of short duration, the movements may be continued. If the pain persists for lengthy periods, however, rest is indicated. If the increased range of movement is maintained after manipulation, further movements may be prescribed safely. If in spite of movement and even in the absence of great pain, the range is continually diminished, rest is indicated. The duration of the pain when the tissues are relaxed rather than its intensity should be our clinical guide.

A. J. SCHOLL, JR.

GYNECOLOGY

UTERUS

Chenhall, W. T.: A Method of Suspension of the Uterus. *M. J. Australia*, 1919, ii, 395.

The author lays stress on the importance of selecting the correct point in the round ligaments at which to place the guide suture. This is determined by studying the uterovesical folds, the infundibulo-pelvic tissues, and the utero-ovarian ligaments.

Through a median incision the abdomen is explored and associated pathologic conditions are dealt with. The uterus is elevated with the hand to determine the level of attachment of the round ligaments. At a point about 3.75 cm. from the uterus the round ligament is caught up by a chromic gut suture passed beneath it. A curved forceps is then pushed through the middle of the rectus muscle and peritoneum about 3.75 cm. above the pubes. The forceps is made to grasp the guides and the ligament made to follow it out through the rectus. The procedure is repeated on the opposite side. The peritoneum is then closed, each ligament is fixed to the edge of the opposite rectus sheath with the guide suture, and the rest of the wound closed with a continuous suture in the sheath, the fat, and the skin.

M. J. GELPI.

Wardlow, Y.: The Interstitial Transplant of the Round Ligaments in the Treatment of Selected Cases of Uterine Retroversion. *Surg., Gynec., & Obst.*, 1919, xxix, 603.

A special instrument devised by the author, called the "hysterotome," is necessary for the technique described: After the abdomen is opened a suture ligature is applied without too much tension to each round ligament at the point where both ligaments meet in the median line and its ends are left long. The hysterotome is then inserted into the uterus at the origin of the round ligament in such a way that the direction of the insertion is backward under the interstitial portion of the tube, then downward and inward so that the point will emerge in the midline about 1 in. below the fundus. When this occurs a loop of Pagenstecher or silk is threaded through the eye of the hysterotome and pulled through the uterine wall as the hysterotome is withdrawn.

The same procedure is followed on the opposite side. The loops are then tied to the traction sutures on the round ligaments and the latter pulled through the uterine wall by means of the loops. The traction sutures on the ligaments are then tied to each other and cut. Usually no further suturing is necessary, but in some cases a stitch or two may be put in the puncture wound in the posterior wall of the uterus. The same technique may be used when one or both tubes have been removed.

The advantages claimed for the technique are: (1) the ligaments are shortened in their anatomical direction; (2) only the stronger tendinous portions of the ligaments are used; (3) the danger of recurrence is lessened; (4) there is no interference with the lymphatic, vascular, or nerve supply; (5) no artificial bands are formed; (6) traumatism is reduced to a minimum; (7) the transplanted portion of the ligament hypertrophies with the uterine wall during pregnancy and adjusts itself physiologically; (8) the operation is simple; (9) the anatomical results are permanent; (10) function is restored to the pelvic organs; and (11) pelvic adhesions are avoided.

M. J. GELPI.

Piccardo, T. J.: Bazterrica's Stomatoplasty in the Treatment of Sterility Due to Congenital Cervical Stenosis (La estomatoplastia Bazterrica en el tratamiento de la esterilidad por estenosis cervical congenita). *Rev. argent. de obst. y ginec.*, 1919, iii, 81.

"The primary rôle in the initial phenomena of fecundation belongs indisputably to the cervix uteri. Its external orifice is the true gateway of fecundation." Thus Piccardo quotes Doleris.

The spermatozoa deposited in the vagina must pass through the external os and for this a certain normality in the size, shape, and reaction of the external os is necessary.

The cervical canal normally contains a transparent, colorless mucus which is distinctly alkaline in reaction, while the vaginal secretion is acid. The latter being unfavorable to the spermatozoa, a positive chemotaxis is set up between the spermatozoa and the mucus which fills the cervix.

It is apparent, therefore, that fecundation is impossible if there is any marked stenosis of the cervical orifice.

Congenital stenosis of the cervix Piccardo defines as an anatomical state due to a disturbance of development which prevented the uterus from undergoing all the proper modifications of puberty. The cervix in this anomaly is characterized by elongation, conical shape, and stenosis of the external os. This condition is frequently accompanied by an exaggerated ante flexion of the uterine body and stenosis of the internal os. Dysmenorrhœa and leucorrhœa are prominent symptoms.

Aside from medical treatment (dilatation), a number of operations have been suggested for this condition, some to correct the stenosis of the external os (excision), and others to correct the shape and dimensions of the cervix itself (amputation, stomatoplasty).

Bilateral excision is not satisfactory because the upper and lower lips are in such close apposition

that the os is impervious to any fluid. Amputation involves the loss of a large portion of the cervical mucosa. Pozzi's stomatoplasty is complicated and difficult to execute.

Bazterrica's operation lies about midway between the simple bilateral excision of Sims and Pozzi's operation and is very easy to perform. The field of operation is disinfected with tincture of iodine and alcohol. The cervix uteri is then well exposed and the anterior lip, held by a Museaux forceps, is brought down to the vulval orifice by traction. A transverse incision, 1 or 2 cm. long, is then made with the scissors on each side of the os as in Thomas' operation, and extended to the level of the insertion of the vaginal vault above the cervix. In the base of the angle formed by the incisions a portion of the cervical parenchyma is resected, care being taken to respect the cervical and the vaginal mucosa. The operation is completed by placing a suture which approximates the cervical and vaginal mucosa and closes the area left by the cuneiform resection. These sutures serve in addition for the hæmostasis of the region. A small strip of gauze is introduced and the vagina lightly tamponed.

The cuneiform resection has a beneficial effect on the internal os uteri because the cicatricial retraction tends to dilate it.

Piccardo is emphatic concerning the choice of cases in which this treatment is indicated. It should be used only in cases of congenital stenosis of the cervix uteri in which the development of the uterus and the conditions of menstruation warrant the assumption that pregnancy is possible.

M. M. MATTHIES.

Pearl, J. F.: On the Removal of Large Cervical Tumors Occupying the Vagina. *Lancet*, 1919, CXCvii, 1194.

Pearl reports a case of intravaginal fibroid and describes the method by which he removed it. The patient was a multipara 48 years old who had had uterine hæmorrhages for three years. Examination disclosed a hard tumor filling the vagina and presenting at the vulva. The mass reached to three finger-breadths below the umbilicus. On the right side was a cystic swelling. Vaginal examination was impossible. At operation the right tube was found to be cystic and bound by adhesions. The left tube and ovary were also bound by adhesions. The uterus was small. The incision was made into the anterior wall of the vagina. The tumor originated from the inner side of the anterior cervical wall below the internal os. The proximal portion was enucleated and the rest delivered through the vagina. The whole tumor measured 5 by 3½ in. and weighed 10 oz. The tubes and ovaries were also removed and the vaginal wall was sutured and drained.

An abdominal operation is essential in such a case because of frequently associated pathologic conditions of the uterus and adnexa, possible malignant

degeneration in an associated intra-abdominal growth, and the impossibility of diagnosing the presence of the growth because a bimanual examination cannot be made. Malignant degeneration of fibroids is estimated to occur in between 2 and 4 per cent of cases.

BERNICE JAMESON.

McCann, F. J.: The Precancerous Uterus. *Proc. Roy. Soc. Med.*, Lond., 1919, xiii, Sect. Obst. & Gynæc., 3.

The author believes that no real progress will be made in the cancer problem until the clinician can seek out and identify the pre-cancerous changes in the different organs and tissues where cancer is prone to originate. He laments the present tendency to relegate the clinician to the background and to look toward the laboratory worker for a solution of the problem. Mutual co-operation he believes is essential.

To operate when cancer is easily recognizable is not enough; we must anticipate its development, and for this must be able to recognize pre-cancerous changes as definite clinical entities.

The subject was brought forcibly to the author's mind by two cases the after-history of which has an important bearing on this subject. The first was that of a woman aged 38 who underwent the operation of curettage for what is termed "fungous endometritis." The scrapings were examined by a pathologist and pronounced benign. While there was a suspicious multiplication of cells within certain gland tubules, there was no evidence of penetration beyond the basement membrane. Five years later the patient was found to have an advanced uterine cancer and from this she ultimately died.

The second case was that of a single woman, aged 54, from whom the author removed a polypus about the size of a hazelnut which grew from the upper end of the cervical canal. On microscopic examination this proved to be benign but eight years later the patient died from uterine cancer with secondary hepatic deposits.

The age incidence of uterine cancer is both interesting and important. From a study of statistics 46 may be taken as that for cancer of the cervix, and 53 for cancer of the uterine body.

The following points are emphasized by the author:

CERVIX UTERI

In the cervix uteri the changes which should give rise to suspicion of cancer may be grouped as follows: (1) erosions; (2) fissures; (3) chronic endocervicitis; and (4) chronic hypertrophy.

Cervical erosions: In the past erosions have been termed "ulcerations," and upon this faulty pathology faulty methods of treatment have followed. An erosion is a new growth composed of glandular tubules and interglandular tissue which under certain circumstances may undergo true ulceration. In the absence of traumatism a definite ulcer in the cervix uteri is either tuberculous, syphilitic, or malig-

nant, and as the two former are relatively rare, it should be assumed to be malignant until the contrary is proved by microscopic examination. An erosion being a new growth—adenoma—it should be treated as other new growths are treated, viz., by excision and not by repeated application of irritants in the form of caustics and similar substances.

Fissures: The rôle of cervical lacerations—fissures—in the etiology of cancer has been debated for many years. It is not only the single tear, but the innumerable smaller ones which cause dislocation of epithelium and are associated with chronic inflammatory changes that predispose to cancer. Statistics have been produced favoring the view that stitching the lacerated cervix after labor has an influence in diminishing the incidence of cervical cancer. No other treatment is so effectual in retarding the chronic inflammatory changes which develop and predispose to cancerous formation.

Chronic endocervicitis: When a chronic discharge continues to flow from the cervical canal of a woman approaching the cancer age there is danger of the subsequent development of cancer within the cervical canal. Moreover, the glandular involvement often extends so deeply into the tissues of the cervix that no local application or curetting reaches the full extent of the diseased area. To eradicate the disease and to prevent the development of cancer a supravaginal amputation of the cervix should be performed. If in addition to the chronic endocervicitis the uterine body is enlarged and the menstrual flow increased or if between menstruations there is an irregular blood loss, the uterus should be removed. Pan-hysterectomy with conservation of the ovaries if otherwise normal is the operation which should be adopted.

Chronic hypertrophy: Reference has already been made to chronic inflammatory thickening of the cervical tissues in association with lacerations or fissures. Should such hypertrophic thickening be marked, especially in women approaching the cancerous age, the cervix should be removed by supravaginal amputation whether there are cervical lacerations or not. If this operation is done skillfully with due regard to asepsis there should not be any subsequent contraction of the outlet to the uterine canal.

*CORPUS UTERI

Fungous endometritis: Fungous endometritis, which is in reality a new growth adenomatous in character, bears a relationship to cancer of the corpus uteri similar to that between a cervical erosion and cancer of the cervix uteri. Examples are on record in which, after repeated curettings, the scrapings which at first were benign in character were later found to be malignant. If exploration of the uterine cavity shows that there is a considerable amount of new growth in the endometrium, and if the woman is nearing the menopause, the uterus should be removed.

Chronic metritis: When in a woman over 40 years of age the uterus is large and painful, bleeds pro-

fusely during menstruation, and pours out a discharge in the interval, it should be removed. Such women are frequently treated by curetting, caustics, and other irritants without benefit, and many of them subsequently develop malignant disease.

Intra-uterine polypi: If adenomatous polypi are found in the uterine cavity the uterus should be removed. "Fibroid polypi" should be examined microscopically on removal to make sure that the disease is not sarcomatous.

After the menopause: In the normal course of events the uterus diminishes in size as age advances and remains quiescent, not giving rise to any local disturbance. The normal post-climacteric uterus is a decadent organ showing no sign of pathologic activity. If examples of uterine prolapse and acute infections be excluded it may be stated that post-climacteric uteri showing pathologic activity which is evidenced clinically by bleeding, discharge, or increased size should be removed.

The disease termed "senile endometritis" is a pre-cancerous condition and frequently associated with cancer of the corpus uteri. It must be the work of the future to anticipate the development of cancer by defining the conditions which experience teaches are followed at a later date by cancerous growth and to treat them by radical methods. Real progress will result from work along these lines, much suffering will be mitigated, and many lives saved.

C. H. DAVIS.

Peterson, R.: The Age Distribution and Age Incidence in 500 Cases of Cancer of the Uterus.
Surg., Gynec. & Obst., 1919, xxix, 544.

The author has collected 500 cases of carcinoma of the uterus from the University of Michigan Hospital, his private clinic, and the Pathological Laboratory of the University of Michigan. These cases were selected chronologically, were all confirmed microscopically by the Director of the Pathological Laboratory of the University of Michigan, and represent the average population of the State of Michigan. The term "age distribution" is used to refer to the number of cases in the series of 500 which were found in each age period, and the term "age incidence" to refer to the ratios at any given age period, obtained by considering the percentage of carcinoma at that age period with reference to the percentage of the population at the same period.

The cases are discussed under the following headings: (1) carcinoma of the uterus, (2) carcinoma of the cervix (3) carcinoma of the fundus, (4) squamous-cell carcinoma of the cervix, and (5) adenocarcinoma of the cervix.

The author contrasts his own findings with those of others and gives the following summary:

1. The maximum age distribution in 500 cases of cancer of the uterus is at the age period between 40 and 45.

2. Eighty-two per cent of uterine cancers occur between the ages of 35 and 65.

3. The young female is not immune to cancer since in 7 of the 500 cases (1.4 per cent) the cancer developed between the ages of 20 and 25.

4. Uterine carcinoma is exceedingly rare below the age of 20 but occurs in an appreciable percentage of cases between the ages of 20 and 25.

5. In 6 out of 7 cancers developing between the ages of 20 and 25 the cervix was the seat of the disease.

6. The maximum number of cases of carcinoma of the cervix is to be found in the age period from 40 to 45.

7. In the cases reported, carcinoma of the fundus was found in an unusually large percentage, i.e., in 94 cases out of the 500 (18.8 per cent).

8. The number of cases of adenocarcinoma of the fundus reaches its maximum between the ages of 55 and 60, fifteen years later than the maximum incidence of squamous-cell carcinoma of the cervix which is reached between the ages of 40 and 45.

9. Adenocarcinoma of the fundus is not a disease of early life as in the series of cases reported there were only 3 cases in 94 in which it occurred before the age of 35.

10. From the analysis of the series reported and the statistics of other writers it is fair to assume that from 10 to 15 per cent of uterine carcinomata are situated in the fundus.

11. A large proportion of the 500 cases of uterine cancer were cases of squamous-cell carcinoma of the cervix — 369 in all.

12. In contradistinction to carcinoma of the fundus, 23.5 per cent of squamous-cell carcinomata of the cervix were found in patients under 40 years of age.

13. Practically 50 per cent of the 369 squamous-cell carcinomata of the cervix occurred between the ages of 40 and 55.

14. Adenocarcinoma of the cervix is much more rare than the other two forms, occurring in only 37 of the 500 cases.

15. The number of cases is greatest in the age period from 40 to 45.

16. Thirty per cent of the 37 cases of adenocarcinoma of the cervix occurred between the ages of 20 and 40.

17. The age incidence of carcinoma of the uterus at different age periods is determined as follows:

Ratio for age period

$$N = \frac{\text{percentage of carcinoma for age period } N}{\text{percentage of population for age period } N}$$

18. The maximum age incidence of carcinoma of the uterus is at the period between 55 and 60. From this age period it declines rapidly to the period between 70 and 75.

19. The greatest age incidence of adenocarcinoma of the fundus is the same as that of cancer of the uterus as a whole, i.e., the age period between 50 and 60.

20. The highest carcinoma incidence of carcinoma situated in the cervix, of squamous-cell carcinoma

of the cervix, and of adenocarcinoma of the cervix is the age period from 50 to 55.

21. After each age period of greatest carcinoma incidence is reached the incidence decreases sharply, a fact which demonstrates the incorrectness of the statement that the age incidence of carcinoma increases with the age period. S. A. CHALFANT.

Forgue: The Operative Treatment of Cancer of the Uterine Cervix (Traitement opératoire du cancer du col de l'utérus). *Presse méd.*, Par., 1919, xxvii, 577.

Forgue has investigated the subject of the operative treatment of cancer of the uterine cervix from the following points of view:

1. The means of obtaining early operation.

2. The limits of operability.

3. The principles which should regulate the choice of operation and the technique.

4. The interpretation of the results.

The factor of first importance in accelerating operation, is of course, early diagnosis, and to make early diagnosis more general family physicians, midwives, and the public should have further instruction regarding the early signs of cancer.

The physician should examine every woman with the least suggestive symptoms and if the findings are positive should see that the patient is operated upon at once. Precancerous states call for particular study.

As regards the limits of operability Forgue states that since the adoption of the extensive Wertheim technique the limits of operability have been doubled but at the same time the operative mortality has also been doubled. The advantages of operation will be greater and its risk less if the diagnosis is made early when the anatomical lesions are less extensive.

The most advantageous radical hysterectomy is the vagino-abdominal operation. The objects of treatment are to reduce the risk of infection and to increase the security against recurrence. These are best attained by avoiding all septic inoculation from the ulcerous cervical neoplasm. Therefore the cancerous cervix should be removed as a closed mass sealed within the vagina. This can be done in either one of two ways: (1) by the abdominal route alone, the section of the vagina being made below two large forceps enclosing the ulcerous lesion; and (2) by the vagino-abdominal route, the operation being begun by a circular vaginal incision at a good distance from the neoplasm, or by a colpohysterectomy, the vagina being then dissected and sutured.

To avoid operative contamination it is very important to establish a solid barrier between the abdominal cavity and the pelvic wound. No drainage is used. The vesical peritoneum and the prerectal peritoneum are sutured to the anterior and posterior walls of the vagina and further peritonization is obtained by utilizing the walls of the sigmoid loop or the rectum.

The study of recurrence has shown that in the great majority of cases recurrence is a continuation of the growth of cancerous foci not completely extirpated. In such cases there is early and rapid invasion of the cylindrical epithelium of the cervical canal but it is the extended infiltration of the parametria which is the most unfavorable element in the prognosis.

As regards the extirpation of the glands, Forgue believes it is sufficient to remove the palpable and enucleable glands on each side in the region of the bifurcation of the iliac artery.

In a series of 40 cases treated by the author there were 4 operative deaths. Of the 36 survivors 23 had a recurrence. Thirteen had no recurrence after three years and of the latter 6 had no recurrence in five years.

Forgue believes that in uterine cancer as in all others there is an individual "coefficient of malignancy" which renders the prognosis more or less uncertain.

As a preventive of recurrence the pre- and post-operative use of radium has been found of value.

W. A. BRENNAN.

Daels, F.: The Indications and Technique of Abdominal Hysterectomy (Indications et technique de l'hystérectomie abdominale). *Bull. Acad. roy. de méd. de Belg.*, 1919, xxix, 702.

Because of the poor results obtained from partial operations in the treatment of chronic inflammatory lesions of the internal genital organs, Daels believes that radical measures are best.

The greater part of the article deals with the technique of hysterectomy in cancer of the cervix to the uterus. As a result of his study of aseptic and infectious conditions of the tissues before operation, the author has reached the conclusion that 6 times out of 10 the streptococcal infection which is present about the cancerous tumor in 60 per cent of the cases extends to the parametric tissues and even to the lymphatic glands.

The treatment of this infection prior to the operation proper consists in curettage and cauterization of the cancerous craters followed for fifteen days by the application of radium. Such treatment disinfects and isolates the cancer and improves the general condition. These advantages Daels believes more than compensate for the danger of the extension of the disease in the two weeks during which the preliminary treatment lasts. It does not, however, cut off infection nor prevent the infected tissues from coming into contact with the peritoneum, ligatures, and sutures during the course of the hysterectomy.

In clinical and experimental research regarding disinfection of the parametric tissues Daels has found that silver nitrate has a bactericidal effect and stimulates reactional proliferation. In spite of the good results obtained by its use, however, he considers pelvic peritonization as the best prophylactic treatment against the extension of the condition.

After the completion of the hysterectomy Daels fixes the vaginal walls to a band formed by the round ligaments sutured to each other.

The report is based on 43 hysterectomies.

W. A. BRENNAN.

ADNEXAL AND PERI-UTERINE CONDITIONS

Robinson, M. R.: Actinomycosis of Both Ovaries and Fallopian Tubes; the Report of a Case. Operation, and Recovery; with a Tabulation of All the Cases of Actinomycosis of the Female Genitalia Recorded in the Literature. *Surg., Gynec., & Obst.*, 1919, xxix, 569.

The invasion of the human body by the ray fungus was first described by Israel in 1877, just one year after its discovery in cattle by Bollinger. The author has succeeded in collecting from the literature only 19 cases in which he believes the diagnosis was proved and the condition involved the reproductive organs. These cases he presents briefly in a table. After discussing the subject and describing his own case, he draws the following conclusions:

1. The microscopic study proved beyond a doubt that the tumors removed from our patient were the ovaries and the fallopian tubes.

2. The fact that at the time of the first operation only the mesosigmoid was involved would seem to indicate that the primary focus was the lower bowel.

3. The fact that the involvement of the internal generative organs was not found until a second operation was performed six months later excludes the possibility that the infection was primary in the genital tract.

4. The location of the actinomyces colonies, both within the tube lumen as well as deep in the ovarian stroma and not immediately beneath the germinal epithelium or upon it, speaks for the possibility that the spreading of the infection proceeded by both continuity and the blood stream.

5. The absence of enlargement of the retroperitoneal, mesenteric, and inguinal lymph glands at the time of both operations and since operation excludes the possibility that the lymph current was the carrier of the actinomycotic infection.

C. H. DAVIS.

Reder, F.: The Cystic Ovary. *Am. J. Obst.*, 1919, lxxx, 719.

In such a delicately constructed organ as the ovary, the extraordinary function of which constitutes one of the most puzzling and interesting problems in physiology, it is reasonable to assume that impairment in the vascular supply need not be severe to bring about textural changes. Mild disturbances are sufficient to change normal into abnormal conditions if they persist long enough. The whole picture appears to be somewhat analogous to the changes the surgeon sees in a partially strangulated intestine. It seems wholly a mechanical condition in which the circulation plays the principal part. Textural changes in the tissues are

brought about, not by inadequacy of the supply of arterial blood, but by embarrassment of the venous circulation bordering on stasis. Such changes in an organ as intricate as the ovary, in which the growth potentialities of the cells are so astonishingly pronounced, are the result of tension and a certain degree of torsion of the mesovarium at its broad-ligament attachment.

Recent investigators admit that atresia of the graafian follicles and a certain degree of cystic formation in an ovary during the menstruating period of life are physiological. Granting this, the question arises as to when this form of cystic degeneration reaches its physiological limits. The answer must be guarded for the following reasons:

1. Cystic degeneration of an ovary seldom mirrors a definite clinical picture.
2. There is rarely severe pain, and the menstrual disturbances are of the ordinary type.
3. Should there be pain, it must be ascribed to torsion of the mesovarium, engorgement of the veins of the broad ligaments, or the presence of adhesions.
4. A bimanual vaginal examination when the ovary is enlarged and lodged in the cul-de-sac will elicit pain, but will not reveal anything more definite unless multicystic follicular degeneration has caused the ovary to become unusually large.

The author's diagnoses were made invariably during abdominal sections for other than ovarian lesions. Most frequently the operations were for chronic lesions of the appendix or retrodeviation of the uterus. The patients were all unmarried and varied in age from 14 to 25 years. Although the cystic degeneration was frequently found to affect both ovaries, in the cases operated upon for chronic appendicitis the lesions were confined to the right ovary as compared with the left ovary in the ratio of about 10 to 1. This may be explained on the ground that the chronic inflammatory condition of the appendix was the cause of an excessive and prolonged vascular supply in which the ovary was compelled to share on account of its proximity to the appendix. Frequently under such conditions the uterus was found apparently in a normal position. At any rate, the retrodeviation was so slight that it could not be considered pathologic. From this fact the inference is justifiable that a chronic lesion of the appendix may invite cystic degeneration of the ovary without concomitant malposition of the uterus.

About one-half of the ovaries not subjected to radical surgical procedure were suspended as close to the uterine cornual angle as possible. When the uterus was in malposition the displacement was corrected by the simplest operative method. When the ovarian ligament was found so extremely relaxed that a proper ovarian suspension could not be obtained otherwise, the sutures were carried through the sides of the uterine body near the cornual zone. Operations pertaining to ovarian suspension should be confined to the median portion of the organ, as

far remote from its lateral border as is feasible. When resection was decided upon, the number of cysts present was the determining factor. The author's technique in such cases is presented.

EDWARD L. CORNELL.

Gaifami, P.: Three Cases of Voluminous Cystic Ovary in the New-Born (Trois cas d'ovaire kystique volumineux chez le nouveau-né). *Rev. franç. de gynéc. et d'obst.*, 1919, xiv, 345.

In one year during which he made autopsies on 50 female infants at the Obstetrical Institute of the University of Rome, the author found 3 cases of voluminous cystic ovaries. The macroscopic and microscopic details with illustrations are given in full.

In discussing the findings Gaifami states that this congenital condition might perhaps be the initial stage of a true ovarian tumor, or at least that it may throw some light on the genesis of ovarian tumors, especially cystomata.

The fact that 3 such cases were found in 50 autopsies might be considered as sufficient evidence that their occurrence is not infrequent, but although the author has performed autopsies on many newly born children, he has found few voluminous cystic ovaries.

In 2 of the cases reported the condition was unilateral, and in the third, bilateral. In two cases the ovary was twisted on its pedicle.

Examination showed also that the altered ovaries contained more or less large cavities which gave them the appearance of sponges and that the ovarian tissue was reduced to a thin layer in which some primordial ovules and graafian follicles were found.

W. A. BRENNAN.

Jayle, F.: The Transverse Lateral Suprapubic Incision in Unilateral Salpingo-Oöphorectomy and in Appendicectomy (L'incision esthétique sus-pubienne transversale et latérale dans la salpingo-ovariectomie unilatérale et dans l'appendicectomie). *Bull. Acad. de méd. de Par.*, 1919, lxxii, 255.

It is most desirable in abdominal surgery that the incision should be such as to leave a perfectly solid scar which should also be as invisible as possible. Therefore a lateral transverse is better than a vertical incision. Jayle has used the former for twenty years.

In cases of a unilateral lesion of the genital organs it appears more logical to approach it from outside the rectus muscle than from inside on the median line as in this way the organ to be extirpated is reached directly.

The chief difficulty in the use of the vertical incision is the difficulty of diagnosing between chronic appendicitis and ovaritis and right salpingitis. Many more or less abnormal appendices are removed from women without any particular benefit because there is also an ovarian or tube lesion which was not suspected. The transverse lateral incision avoids this error because it gives access to the ovary

and tube as well as to the appendix. In 20 cases in which Jayle operated during the past two years on a diagnosis of appendicitis alone, the ovary and right tube were normal in only 2, hæmorrhagic ovariitis was found in 5, polycystic ovariitis in 4, a fibroma of the ovary in 1, and salpingo-ovaritis in 8.

Jayle makes a transverse incision 6 or 7 cm. long in the pubic region, draws the underlying tissues and the hypogastric vessels back with retractors, and opens the peritoneum. When the patient is placed at an angle of 45 degrees the tube and right ovary are seen easily. By turning her on the right side the cæcum and appendix are brought into view.

Jayle has used this incision for appendicectomies on women since 1913 as salpingo-ovaritis is usual in such cases and this route makes possible pelvic exploration. Moreover the incision gives a minimum amount of traumatism. In cases in which salpingitis or ovariitis with or without appendicitis complicates a beginning pregnancy the transverse lateral incision permits operation without encroaching on the uterus which remains practically outside the operative field.

W. A. BRENNAN.

MISCELLANEOUS

Spalding, A. B.: A Study of Frozen Sections of the Pelvis with the Description of an Operation for Pelvic Prolapse. *Surg., Gynec. & Obst.*, 1919, xxix, 529.

The pelvis of a 32-year-old woman, a nullipara who died of tuberculosis, was cut by frozen section into four segments. The surfaces of the segments were photographed and the pelvic fasciæ outlined.

From these photographs it can be seen that the uterus hangs in the paracervical tissue which is intimately attached to the pelvic fascia at the arcus tendinous which gives strong support to the bladder, vagina, and rectum. The levator ani muscles and the fascia support it below and bring the lower part of the vagina and rectum toward the symphysis. The ligaments of the uterus, the peritoneum and the pelvic fascia above the white line give support from above and serve to bring the fundus of the uterus forward.

The operation described by the author has been done only during the past few months. Its first step consists in dissecting the fascia in the anterior vaginal wall free to the arcus tendinous and overlapping it as was described last year by Rawls. The cervix is then amputated according to the old method of Hagar, and two deep sutures are placed on either side to control the hæmorrhage from the cervical branches of the uterine arteries. The peritoneum is then opened below the bladder and a subtotal vaginal hysterectomy is done, the cervical stump being attached to the sacro-uterine and severed broad ligaments. The round ligaments are then drawn through the cervical canal and sutured on the vaginal surface. This lifts up the cervix to which the overlapped fascia is attached. In cases of rectal prolapse the rectum is supported by oper-

ations described heretofore by Ward, Studdiford, and others.

In describing his own operation the author emphasizes particularly the value of preserving the paracervical tissue by means of a subtotal vaginal hysterectomy and of supporting the cervix by drawing the round ligaments through the cervical canal.

M. J. GELPI.

Draper, W. F.: The Detention and Treatment of Infected Women as a Measure of Control of Venereal Diseases in Extra-Cantonment Zones. *Am. J. Obst.*, 1919, lxxx, 618.

Women in the extra-cantonment zones in Virginia who were found conducting themselves in an immoral manner were apprehended by the local police working in co-operation with the military police and law enforcement officers of the Commission on Training Camp Activities. Upon appearance before the police court magistrate they were immediately ordered to the Public Health Service and Red Cross out-patient clinics for examination to determine whether or not they were infected with venereal disease. Pending the outcome of the examination they were usually held in the detention home although the jails were sometimes utilized for this purpose.

Those found to be infected with venereal disease were committed to the detention hospital for treatment until such time as they were considered non-infectious. They were then returned to the police court for trial on the charge for which they were arrested.

The period during which infected women were detained in the hospitals for treatment lasted from one to eight months. The average time spent in the detention hospital was about three months.

In cases of gonorrhœa three successive negative slides taken one week apart were required for release. Women with syphilis were released as non-infectious when there were no visible lesions of the skin or mucuous membranes, and after they had received mercurial treatment and several injections of salvarsan.

In the opinion of the writer the detention hospitals were a potent factor in controlling the spread of venereal diseases in extra-cantonment zones in the following ways:

1. By making it possible to remove a large number of infected immoral women from the community and hold them absolutely apart from the general population for a number of months.

2. By making the chances of isolation for a considerable period of time so great as to discourage immoral women from operating in these areas.

3. By giving a practical demonstration to the community of the high prevalence of venereal diseases in immoral women, and of the time and effort necessary for the treatment of these diseases.

4. By actually removing foci of infection by medical measures.

The treatment of the women in the detention hospitals is believed to have been of less importance

in controlling venereal diseases in the extra-cantonment zones than the other factors mentioned. On one occasion eleven out of twelve women released from the detention hospital at Newport News, Virginia, were returned with new infections. Comparatively few of the inmates expressed themselves as having any intention of changing their mode of life. On the other hand, it is difficult indeed to estimate the number of venereal infections which were prevented in a year's time by holding two hundred and forty infected and immoral women in isolation.

Hopkins, A. H.: The Treatment of Climacteric Hypertension. *N. York M. J.*, 1919, cx, 930.

This type of hypertension occurs principally in apparently healthy women who are overweight at or soon after the menopause. They are high-strung, intense, excessively nervous, susceptible to worries, and very apprehensive. The early evidence of trouble is a variable high blood pressure followed later by gastric and nervous disorders, headache, and cardiac embarrassment. The blood is normal and the kidney changes and peripheral fibrosis occur only very late.

The author attributes the cause to the following three factors: (1) an alteration in the glands of internal secretion; (2) continued nervous strain; and (3) constipation.

These, one or all, result in an increased vascular tonicity which in the beginning is spasmodic but gradually becomes more constant until, near the age of 60, the first evidences of fibrosis appear.

From the standpoint of treatment the condition may be considered to have three stages: (1) a stage characterized by high blood pressure and nervousness; (2) a second stage with higher and more constant pressure, gastric neurosis, and cardiac or pressure symptoms; and (3) a third stage in the sixth or seventh decade presenting the early evidences of senility.

In the first stage the hypertension should not be attacked too energetically but attention should be paid to rest and exercise, diet, elimination, and the control of the nervousness. For the latter, the author advises corpus luteum, especially by hypodermic, and for some of the more obese patients very small doses of thyroid extract.

In the second stage the same general treatment is indicated, but it must be supplemented by more active measures such as properly guarded sweat baths, nitroglycerin, aconite, benzyl benzoate, or blood letting. The latter should consist of the withdrawal of from 250 to 300 c. c. of blood for several days.

In many cases rest in bed for two or three weeks is of very great benefit. The gastric neurosis is to be treated symptomatically, the condition of the gastro-intestinal tract first having been investigated.

In the third stage the two great dangers are cerebral hæmorrhage and cardiac decompensation. As a rule, drugs are not indicated. Instead, rest and general supervision of activities to guard against mental and physical strain are advised.

S. A. CHALFANT.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Villaneuva, D. F.: Intermittent Intestinal Occlusion in Pregnancy (Oclusion intestinal intermitente en el embarazo). *Rev. de med. y cirug. práct.*, 1919, xliii, 233.

Villaneuva gives a detailed report of two cases of intermittent intestinal occlusion observed by him in pregnant women. Well-marked symptoms of auto-intoxication, which was demonstrated also by urinalysis, were present in both.

The various factors during gestation which might cause intestinal occlusion, some of which are obstetrical in character and others purely surgical, are discussed.

In the two cases reported the uterus was in normal position and there were no uterine or pelvic tumors. While the small intestine was displaced by the gravid uterus, the displacement was not sufficient to cause the occlusion. Neither did it seem probable that the condition was due to uterine adhesions as in such case it would have been persistent. There was no evidence of past or present hernia. Intestinal invagination is infrequent in adults and associated with diarrhoea. Gall-stones and faecal impaction were also considered but were excluded by the absence of colic and the intermittent nature of the complaint.

Since he could find no other explanation, Villaneuva came to the conclusion that an alteration or disturbance of the nerve supply of the intestine produced the spasmodic obstruction.

M. M. MATTHIES.

Kaufman, B.: The Relation of Malaria to Pregnancy. *N. York M. J.*, 1919, cx, 1028.

In discussing the relation of malaria to pregnancy and the puerperium the author contends that the presence of malaria need cause no great alarm. It may occur during any stage of the pregnancy or manifest itself early or late in the puerperium. It is encountered chiefly in districts where the disease is prevalent in either its acute or latent form.

No matter when malaria occurs, suitable doses of quinine should be administered. It is essential, however, that the presence of the plasmodia be proved both chemically and microscopically in several specimens of blood. That quinine should be administered is axiomatic. The exact salt used is immaterial so long as the requisite amount is given and absorbed. The drug itself is a well-known abortifacient but in true cases of malaria its use has a directly opposite effect. Moreover, if it is not given in sufficiently large doses to overcome the infection quickly, abortion or miscarriage will be produced by the disease itself.

Even after the infection has been controlled the use of quinine should be continued as a prophylactic measure throughout the pregnancy. In this way only can a recrudescence or a new infection be prevented. The best time to take quinine as a prophylactic is on retiring.

In malarial attacks occurring during the pregnant state urine examination shows a marked amount of albumin. This decreases and disappears when the infection has been controlled.

The author's experience in badly infected malarial districts proves conclusively that the disease must be recognized in its early stages and treated with quinine in sufficient doses to overcome it. It is also essential that the quinine treatment be continued as a prophylactic measure during the remainder of the pregnancy and during the puerperal state.

That malaria does not predispose to eclampsia is also quite evident from the author's study.

In the case of persons with an idiosyncrasy to quinine it is best to start the treatment by giving 1 c.c. of a 1 per cent sterile solution of quinine and urea by hypodermic intramuscular injection. This has no ill effect and is well tolerated. The dose may be increased until the amount given is sufficiently large to control even the most obstinate cases.

If during the puerperal state chills, fever, and sweats are present in a proven case of malaria, quinine may be given for two or three days. If at the end of that time there is no change in the clinical picture, it is evident that the symptoms are not due to malaria.

Quinine taken by the mother has no harmful effect on the child, but the child may be harmed by the milk of a mother who has fever.

The author begins giving quinine immediately after delivery and continues it for about ten days as in malaria a postpartum rise in temperature occurs invariably.

The reason given for the postpartum recrudescence of the disease is that the ergot given during or after the third stage of labor causes the muscular coat of the spleen to drive the plasmodia held within the spleen out into the blood stream and in this way a fresh infection in either the fully developed or the latent form is set up.

Postpartum hæmorrhage occurred only once in a large series of cases and this particular patient had not received any quinine.

The uterus in malaria shows a relative sluggishness in undergoing natural involution. Quinine stimulates this important process. The healing of perineal wounds is also slow in malaria.

N. W. VAUX.

Phaneuf, L. E.: Abruptio Placentæ Associated with Spontaneous Rupture of the Uterus; with Report of Two Cases. *Surg., Gynec. & Obst.*, 1919, xxix, 575.

CASE 1. The patient was a primipara 33 years of age. Bleeding was started by the jolting received while she was riding in a street car. The first signs of hæmorrhage were noticed at 5:30 p.m. At 8:30 the same evening the patient showed signs of marked exsanguination.

When the peritoneal cavity was opened considerable bloody fluid gushed out. The incision having been extended downward, the uterus was found ruptured in the median line half way between the cervix and the fundus. The rent, which was about 2 in. long, was through the peritoneum and muscularis but not through the endometrium.

Since the tear was longitudinal and in the median line, the endometrium was incised over the area of the rupture and the incision in the uterus was enlarged upward. A small still-born female foetus corresponding in size to a pregnancy of about seven and a half months was delivered by breech extraction. Half the placenta was found to be separated. The placenta, the membranes, and large clots which filled the uterus were removed.

This case was almost hopeless from the start, but the patient reacted to treatment so well the first two days that hope of saving her life was entertained. Abdominal distention developed, however, and death occurred on the fifth day.

CASE 2. The patient, a primipara, was admitted to the hospital at 9 p.m., April 26. At this time she had moderate pains and a pulse of 68. At 3:45 a. m., April 27, she was bleeding slightly and her pulse was 90 but of good quality. The foetal heart had not been heard. An hour later the pulse was 120, thready, and of poor quality, and there was free bleeding from the vagina. The uterus was tense and tonic.

When the peritoneal cavity was opened a rent about 2 in. long was discovered running obliquely from the fundus toward the right tube and extending through the serosa and muscularis, but not through the mucosa. The uterus was incised in the median line, and there was practically no bleeding from the cut uterine wall. Practically all of the placenta was separated. A small still-born foetus at term was extracted by the breech, the placenta, membranes and clots were removed, and the cervix was dilated from above. The patient was discharged well on the twenty-sixth day after operation.

EDWARD L. CORNELL.

Cornell, E. L.: Ruptured Uterus Occurring Twice in the Same Patient. *Surg., Gynec. & Obst.*, 1919, xxix, 574.

The patient was a colored woman 27 years of age. Her father and mother were living and well. She had no sisters or brothers. As a child she had had rickets and was unable to walk until she was 5 years old. At 26 she had scarlet fever.

In 1913 she was operated upon at St. Luke's Hospital for threatened rupture of the uterus. The uterus was found to be intact and the baby lived for two days. A classical cesarean section was done. On July 27, 1915, she went into labor for the second time. In this instance a diagnosis of rupture of the uterus was made and another classical cesarean was performed at St. Luke's Hospital several hours after labor began. Recovery was good. The baby was dead before the operation.

On Sept. 21, 1918, at 7 a.m., the patient began to have pain in the lower abdomen which was cramp-like in character and recurred at half-hour intervals. At 4 p.m. it became worse and she was scarcely able to walk. One attack of the pain was particularly sharp, but she did not know when the rupture took place. She thought she felt the baby move late in the afternoon and evening. At 6 p.m. she decided to go to the hospital as she believed that she was in labor.

On admittance to the hospital at 9 p.m. she showed signs of abdominal hæmorrhage. No foetal heart tones could be heard. The condition was diagnosed as rupture of the uterus and the patient was prepared for operation. At operation the usual abdominal incision for the classical cesarean section was made. Free blood and clots were found as soon as the abdomen was opened. Between the old abdominal scar and the uterine scar was a dense adhesion made up of omentum and scar tissue. When this was severed the uterine scar came into view. The rupture was situated in the old scar and was about 8 cm. long. The placenta, which filled the gap, was covered with blood clots. On passing the hand through the placenta the sac was found to be intact. The foetus was in breech presentation, the back on the left side. Delivery was made in the usual manner.

The child was found to be in a state of rigor mortis, and its head was bent and fixed to the left. The uterus contracted down nicely. The delivery of the placenta was followed by a Porro cesarean operation, and the abdomen was closed in the usual manner. The operation was practically bloodless. A direct salt solution transfusion was given. The patient was pulseless for a short time but soon revived. She was put to bed in fair condition.

The convalescence was stormy for about six weeks. During this time a rather large abscess formed in the pelvis on the right side and a severe bronchitis developed. Associated with the latter was an infiltration of both lung apices so marked that an internist made a tentative diagnosis of pulmonary tuberculosis.

The abdominal abscess opened through the lower end of the abdominal scar and through the cervix. Three days later the temperature dropped to normal and the patient went on to recovery. She was discharged from the hospital nine weeks after the operation. Examination four months later showed the abdominal viscera to be normal. The patient had gained in weight and was in good general condition.

EDWARD L. CORNELL.

Wolf, E. B.: A Case of Ectopic Gestation which Burst into the Rectum. *Indian M. Gaz.*, 1919, liv, 419.

The patient, an ignorant country woman admitted to the hospital Aug. 7, 1919, complained of abdominal pain and obstruction in the rectum.

Three years previously menstruation had stopped for two months when suddenly she had a very acute attack of pain in the lower abdomen and a slight red vaginal discharge. The pain gradually passed off. From that time on she again had suppression of the menses, noticed that her abdomen was larger, and suffered slight intermittent abdominal pain. Soon she felt abdominal movements and her relatives believed her to be pregnant. This condition lasted until the ninth month when she had severe pain again with tightness of the abdomen. As labor did not set in, however, her relatives concluded that the condition was an "air tumor" and gave her native medicine to "melt" it. In the course of several months the abdomen gradually decreased in size and menstruation was re-established. Slight pain, however, persisted in the lower abdomen. Subsequently the patient was in comparatively good health until six months previous to examination when she began to have frequent stools which eventually were mixed with blood and mucus.

Vaginal examination showed a relaxed outlet, a firm and enlarged cervix, and induration and indefinite masses in the cul-de-sac and both fornices. It was impossible to outline the uterus. Rectal examination revealed large external hemorrhoids and a sanio-purulent fecal discharge with a most offensive odor. On introducing the finger a sharp cutting edge of a flat bone was felt and the bone was removed with some difficulty. This seemed to be a portion of a fetal skull.

At operation there was still an offensive discharge, and about 3 in. from the external sphincter, a little to the right of the mid-line, a mass of bones which apparently extended from the cul-de-sac into the right wall of the rectum was found. These were gradually removed with the fingers. A large blind sac with irregular edges was then discovered opening into the right rectal wall. Vaginal examination after the operation showed that the bulging mass in the cul-de-sac had disappeared, that there was still some induration in both fornices, and that the uterus was in good position, a little larger than normal and with slightly restricted movement on the right. The patient stood the operation well and made an uninterrupted recovery.

The bones removed numbered 62. There were 4 very thin cranial bones, the largest, the occipital bone, measuring 5 by 3.5 cm.; 22 ribs, the longest 5 cm.; both femurs, each measuring 5.5 cm.; both tibiae, each measuring 4.5 cm.; 5 smaller long bones hard to differentiate; both iliac bones, each measuring 2 by 2 cm.; both scapulae; 9 small vertebrae; and 14 imperfect bones difficult to identify.

EDWARD L. CORNELL.

Essen-Moeller: The Results and Indications for Abdominal Cæsarean Section (Ueber die Erfolge und Indikationen des abdominalen Kaiserschnitts). *XII Versamml. nord. chir. Verein.*, Christiania, 1919, July.

In the gynecological clinic at Lund 106 abdominal cæsarean sections were performed for the following indications: eclampsia and premature detachment of the placenta, 10 cases with 3 deaths (eclampsia); placenta prævia, 7 cases with 1 death (embolus); myomata, 8 cases with 1 death (ileus); mechanical malformations, 74 cases with 1 death (peritonitis); vaginal stenosis and other rare conditions, 7 cases with no deaths.

Of the fetuses 7 were dead before the operation and 2 were born alive, but died soon afterward because of malformation of the heart and umbilical hæmorrhage. The others lived.

In eclampsia the author advocates abdominal cæsarean section only when the difficulties of the vaginal cæsarean section appear to be too great.

In placenta prævia he does an abdominal cæsarean section only on non-infected patients when hæmorrhage is threatening and the width of the cervix is such that version is impossible.

In cases of myoma the indication for cæsarean section is either absolute or altogether wanting because during the birth the myoma has become pulled upward from the pelvis.

In narrow pelvis the indication for the operation is most difficult to determine. The author discusses each operation separately and comes to the conclusion that when it is certain the patient is not infected and the labor pains cannot overcome the obstruction, cæsarean section is to be preferred to the use of high forceps, version, or perforation.

If the patient is infected, version or use of the forceps should be tried before perforation of a living fetus is undertaken.

Only when it is not probable that the patient will ever be able to give birth to a living child should the Porro operation be performed even in the presence of infection.

W. A. BRENNAN.

Lecocq, R.: Delivery of a Living Child by Hysterectomy without Prior Opening of the Uterus (L'accouchement par hystérectomie sans ouverture préalable de l'utérus, l'enfant étant vivant). *Ann. de gynéc. et d'obst.*, 1919, lxxii, 541.

Removing the uterus containing a living child without previously opening it was first done by Reymond at Paris in 1911. In this instance it was done in a desperate case in which the mother's life was at stake. Both mother and child lived. Since then, the procedure has been repeated by Reymond in 4 other cases and each time the child was saved. In 1 case the mother died from general peritonitis, being severely infected at the time of operation.

Lecocq's article is based on these 5 cases and gives the history of each. The operative indications in the 5 cases were for a hysterectomy or a Porro operation. The instruments necessary for the operation

described in this article are those required for an ordinary hysterectomy. As soon as the uterus is freed it is removed to another room where the child is extracted by an assistant. The surgeon does not concern himself with the uterus after its removal.

In some cases it is necessary to resuscitate the child. It is most important that the time between the last ligation and the delivery of the child should be as short as possible. In the cases reported it varied from twenty-seven to thirty seconds. The life of the child is not compromised by an interruption of the circulation for thirty seconds as there is sufficient oxygen in the placental blood to prevent asphyxiation. The hæmorrhage following the removal of the uterus is slight, a fact which is interesting when the usual extensive blood loss in the cæsarean operation is considered. In all of the cases the mother was able to nurse the child three days after the operation.

W. A. BRENNAN.

LABOR AND ITS COMPLICATIONS

Macias de Torres: Some New Theories Regarding the Mechanism of Flexion and Engagement in Vertex Presentations (Algunas ideas nuevas acerca del mecanismo de la flexion y el encajamiento en las presentaciones de vertice). *Thesis*, 1919.

Macias de Torres undertakes to explain the ordinary means by which flexion is brought about in vertex presentations. The older authors supposed that the foetus arranges itself in the most favorable situation in the limited space available in the uterine cavity and that consequently the vertex is presented when the head is the lower pole. It has also been explained as the effect of the curve of the primitive line which persists during all the phases of foetal development. In modern times both explanations have been discarded since it has been proved by direct observation that when engagement does not take place during the pregnancy, the foetus presents itself at the time of parturition at the superior straight in an attitude which might be called indifferent, that is, intermediate between flexion and extension. It is admitted also that the oblique and transverse diameters of the superior straight are sufficiently ample to permit engagement without previous flexion and that this would then take place afterward in the concavity or when the lowest portion of the foetus impinges on the perineum, though this is not true in the majority of cases.

Those who admit that flexion may not be produced even at the time of engagement try to explain it in two ways. Zweifel's theory is based on the inequality of the arms of the lever on which the uterine force works which is transmitted to the head by the vertebral column. The axial pressure transmitted to the head is not distributed equally between the facial and occipital portion because the point on which the impulsive force acts is nearer the occiput than the forehead, the facial arm of the lever being somewhat longer than the occipital and the vertex, therefore, progressing more rapidly than the

face. Support has been given also to the theory that the foetal head engaged without flexion arrives in this manner at the perineal floor and that the flexion is caused by the reaction of the pelvic diaphragm.

That flexion is produced in the concavity, as claimed by certain authors, is true in some cases but these are few as ordinarily flexion precedes engagement. On the other hand, the study of the pelvic and foetal diameters demonstrates that engagement in the indifferent attitude, while possible, would require such a compression of the soft parts that it is not apt to occur. Furthermore, the maximum transverse diameter, the only one which would permit engagement without flexion, is considerably shortened at both ends by the prominence of the psoas muscles. To this must be added the fact that foetal engagement in the superior straight is produced center for center, and since the greatest transverse diameter is nearer the promontory than the pubis, it is not practicable because one of the parietal eminences would impinge upon the promontory while a considerable space would be left between the other and the pubis, and a more anterior transverse diameter which might be practicable is easily shorter than the oblique diameters. These are, therefore, the diameters most easily negotiable by the foetal pole.

For these reasons Macias believes the fact indisputable that in almost all cases flexion must precede engagement. Even supposing that this were not so and that the head entered the concavity without flexion, the theory of Zweifel seems to him to be impractical, for while the slightest difference in the length of the arms of the occipitofacial lever would be sufficient to provoke flexion, the resistance at both points being equal, it remains to be proved that this resistance is uniform, because if it were ever so little greater on the shorter arm of the lever, flexion could not be produced. It is, indeed, very probable that the resistance which the two cephalic poles encounter in their descent through the concavity varies a great deal. So far as the possibility that the head of a mature foetus would reach the perineum without flexion is concerned, the previous arguments demonstrate the difficulty of this occurrence in the vast majority of cases.

Becerro de Bengoa explains the deflexion which is frequently observed in occipitoposterior presentations as due to the diminution of the sine of the angle formed by the uterine axis and the vertebral column which is produced when the uterus contracts and the woman is lying in a horizontal position. By the same reasoning applied to occipito-anterior cases this explanation would logically require the diminution of the sine of the uterovertebral angle to produce flexion. A point presented by this theory which Macias considers worthy of consideration is that the diminution of the value of the stated angle has an influence on the flexion or deflexion of the head, though he interprets in a different manner the mechanism by which this cause works, since to admit the theory of Becerro in its entirety it would

be necessary for the head to remain fixed with such energy at the edge of the superior straight that it could not follow the movements of the trunk. Flexion which might be produced in this way would always be very limited, while as a matter of fact it is usually profound, particularly in cases in which the presentation is occipito-anterior.

While Macias accepts none of these theories, even in their general lines, he states his beliefs as follows:

1. The greatest foetal diameter always presents according to one of the oblique diameters which as a general rule is the left. The only exceptions occur in cases of flat pelvis in which the mechanism of engagement is somewhat different.

2. The head of the foetus adopts primarily an indifferent attitude.

3. It is difficult to admit in a general way that flexion follows engagement, and in cases of engagement without flexion parturition is always considerably lengthened.

Before explaining his own theory in detail Macias describes the anatomical superior straight and the clinical straight and compares the planes and axes of the two and their relation to the uterine axis. For obstetrical purposes, the only planes and axes of interest are those which pertain to the clinical straight, and as the axis of this is in front of the axis of the classical straight, it follows that the uterine axis is considerably posterior to that of the plane of engagement; i. e., the uterine force does not work upon the obstetrical straight directly but with a certain inclination. To this fact there are no exceptions except in cases in which the abdomen is excessively pendulous. If the uterus is represented as a tube set up vertically, the superior straight represents a narrowing of the tube situated at a somewhat higher level posteriorly than in front. As a consequence, the foetal head which descends in the indifferent attitude finds itself held up by an obstacle which cannot be overcome at the posterior extremity of the oblique diameter, while in the anterior portion of the same diameter there is no appreciable obstacle to oppose its descent. It is not, therefore, as Zweifel believes, the inequality of the arms of the lever which determines flexion, for then it would be produced always and would be equally complete in all cases except when the arms of a lever might be equal or the posterior longer than the anterior. That which determines flexion before engagement takes place is the inequality of the resistance which is opposed to each of the arms of the lever, i. e., bony resistance at the posterior portion and only the weak obstruction of the soft parts at the anterior portion. Starting from this base, Macias describes the manner in which flexion and engagement are produced in each type of case.

In occipito-anterior vertex presentations, the head descending in the indifferent attitude finds itself detained at the level of the forehead by the sacro-iliac synchondrosis, and therefore the impulsive force of the uterus encounters an immovable obstacle at the level of the forehead and not at the level of the

occiput. Thus all the energy is expended upon the latter point, causing it to descend forcibly while the forehead remains immovable. The consequence is a profound flexion presenting in the oblique diameter which corresponds to the frontosuboccipital foetal diameter, and the head enters the concavity in a manner which permits descent and rotation with ease, being held back only by the resistance of the soft parts.

In occipitoposterior presentations conditions are very different. The occiput being detained at the level of the sacro-iliac synchondrosis and all the uterine force acting upon the anterior extremity of the head, the face descends and there is always a certain degree of extension which may lead finally to a face presentation. Occipitoposterior presentations have a greater tendency to be transformed into face presentations than have occipito-anterior presentations, and this Macias considers an argument of great force in support of his hypothesis.

The transformation of occipitoposterior presentations to mento-anterior presentations, however, does not take place in every case. The occiput being stationary at the sacro-iliac synchondrosis and the anterior extremity of the fronto-occipito diameter descending, the result is not the same as in a case of occipito-anterior presentation when the diameter which presents at the superior straight is a small diameter, such as the suboccipitobregmatic. In this case the presenting diameter is a large one, occipitofrontal or occipitonasal, and the further the chin descends, considering the occipital point immovable, the more all the diameters are increased from the occipitofrontal to the occipitomenthal which is the largest of all. Consequently the pelvic diameters become insufficient and the head is detained at the level of the superior straight in a position of slight extension but unengaged. This accounts for the frequency with which vertex presentations in occipitoposterior positions remain unengaged until the time of parturition. Even though some of them appear to be engaged, it is not so. In reality they remain stationary at the superior straight without entering it.

In the moment of parturition, when the uterine contractions represent an infinitely impulsive force, progress occurs in the following manner: If the disproportion between the oblique diameter and the foetal presenting diameter is not large, the uterine force is able to cause engagement in the attitude in which the foetal pole happens to be found, but always there will result an engagement with the head arranged in such a manner that later movements of the parturition do not take place easily. The slowness of parturition in occipitoposterior cases is due to the absence of flexion, and it is equally true that in such cases the labor progresses rapidly as soon as the head is flexed, always within the concavity, by one mechanism or another. The greater length of the arc of the circle which the occiput has to travel in order to pass from the posterior extremity of an oblique diameter to the anterior end of

the anteroposterior diameter is not responsible, therefore, for the difficulties encountered in these labors. The proof lies in the fact that the steps which are longest are the engagement and the descent. Rotation is rapid after a somewhat accentuated flexion has been obtained. At least in the majority of cases this flexion takes place somewhat before the foetal pole reaches the perineum. The wall of the anterior arc of the pelvis represents a bony plane with a uniform inclination, i. e., it can be considered bony because the obturator foramen is closed by the aponeurosis which is reinforced by muscles which contract actively in the moment of parturition and make the opening of the obturator foramen useless as a means to make the passage of the foetal head easier.

The anatomical condition of the posterior arc is very different. After the narrowing which represents the superior straight, there is a hollow corresponding to the lateral surface of the anterior aspect of the sacrum and the coccyx. Therefore, the foetal head, pushed forcibly through the superior straight, encounters anteriorly a uniform resistance. Posteriorly, once past the promontory of the sacrum, a hollow permits the occiput to progress with relative rapidity and consequently a certain degree of flexion results which compensates for and overpasses the slight extension which was present at the moment of engagement. Then follows the difficult progression of the foetal head until the occipital end reaches the sciatic notch. Here there are no obstructing membranes, as in the anterior portion, and the organs which traverse the notch are easily compressed. Accordingly, the anterior extremity of the foetal pole encounters throughout its descent a uniform resistance while the posterior end meets less resistance and resistance that is uneven. As a result there is produced a flexion which is particularly rapid when the occiput reaches the sciatic notch, and once accomplished, the remaining steps go on without difficulty.

Some cases of occipitoposterior presentation are irreducible, i. e., rotation does not take place spontaneously. If the cause of this anomaly is investigated it is seen that flexion is always lacking. A certain degree of width in the pelvis at the level of the superior straight in these cases or a relative smallness of the foetal head does not have a beneficial influence on the progress of parturition, but up to a certain point is rather prejudicial since it permits the engagement of the foetal pole in a diameter nearer the occipitomenal than that which is typical, and from this comes a sincipital or a forehead presentation. As a consequence conditions are even less favorable to the spontaneous solution of this obstetrical problem.

Another type of case which occurs with great frequency in primary occipitoposterior presentations, especially in the multipara, is the following:

The head is lying in an oblique diameter and with the occiput directed toward the sacro-iliac synchondrosis, but the diameter is too small to permit

engagement by a diameter which must be greater than the occipitofrontal and less than the occipitomenal. The uterine contraction is not able to produce engagement and the head therefore remains a long time upon the superior straight without entering it.

The natural evolution of these cases can be summed up in a few words: rotation precedes engagement. That is, the foetal head turns, remaining always free upon the straight until the foetal diameter takes a frankly transverse position. Afterward the occiput becomes anterior so that the primary occipitoposterior presentation becomes changed before engagement into occipito-anterior. After this, the remaining steps take place with a truly marvelous rapidity in many cases. In such instances it is easy to assume on digital examination that the pelvis is flattened as the promontory is always especially noticeable in front. This, however, is perfectly normal as mensuration will prove. If the obstetrician is deceived by the momentary impression and assumes that the pelvis is flat he will do a podalic version with such success that he will be much surprised. Many of the brilliant results obtained in cases of alleged narrow pelvis treated by version are due to this simple explanation, i. e., that there is no narrowing but simply an occipitoposterior or an occipito-anterior presentation which has not engaged as, because of great laxity of the abdominal walls, the uterine axis coincides with that of the straight or is anterior to it and therefore does not permit the mechanical action necessary to produce flexion which would effect engagement.

Another factor which is easily proved clinically and lends great weight to the author's theory is the manner in which parturition takes place in flattened pelvises. In these the anteroposterior diameter is shortened in greater or less proportion and consequently the oblique diameters are also somewhat shorter than normal, to the point of impeding engagement, whatever may be the degree of flexion and the orientation of the occiput. Under the influence of the uterine contractions, the head turns until it reaches the transverse diameter which is not only the largest of all in flat pelvises, but usually larger than in the normal pelvis. In this diameter engagement takes place, but it will be without flexion for flexion cannot be produced since the two ends of the transverse diameter are always found at the same height and in the descent through the concavity the same resistances act upon the occiput and upon the forehead since both halves of the pelvis are symmetrical. Thus the attitude is indifferent, until rotation of the foetal trunk produces rotation of the head and conditions change and permit some flexion. This fact alone suffices to refute the hypothesis of Zweifel, since the inequality of the arms of the lever could never produce results more obvious than in these cases of engagement in the transverse diameter in which the resistances are absolutely equal.

Of course, there are cases of narrow pelvis with engagement of the head in the transverse diameter

in which there is a previous very marked flexion. In such instances the promontory detains the posterior parietal eminence upon which the head turns in such a manner that it descends and enters the superior straight, the biparietal diameter being replaced by the bitemporal which is smaller and permits engagement.

The author adds a note on asynclitism. If by asynclitism it is meant that one of the parietal eminences enters the superior straight before the other, the presence of posterior asynclitism is indisputable in normal cases, while in narrow pelvis the asynclitism usually is anterior. If, on the contrary, is meant by asynclitism a lateral deviation of the head of the foetus in order that flexion may be obtained, asynclitism is not present, because all the motions which the foetus makes in parturition are entirely passive, imposed by the time and the place in which the resistances act. Consequently there is no external cause which can modify the orientation of the biparietal axis, i. e., this diameter, (of which the ends are the two parietal eminences) at no moment of the progression impinges on the walls of the pelvis so energetically that the descent of one of them would be impeded or even retarded with respect to the other.

M. M. MATTHIES.

Schulze, A. G.: The Action, Use, and Abuse of Pituitrin. *J.-Lancet*, 1919, xxxix, 584.

Although pituitrin has been used in obstetrics for some years and has given good results when employed with caution, its use is attended nevertheless with a certain amount of danger. The nearly ideal condition for its administration is encountered in a healthy multipara with fully dilated os and ruptured membranes, when presentation is normal, the foetus resting on a relaxed and easily stretched perineum, and the pains show a tendency to lag. The age and parity of the patient must be kept in mind, the bladder watched, and the condition of the anterior lip of the cervix determined before the drug is given. The fact that a lazy uterus needs stimulation, whereas an exhausted uterus calls for relief, should also be remembered.

The dose for intrapartum use should never be as much as 1 c.c., and the accepted dose is 3 or 4 m. An overdose may cause in the mother deep lacerations of the cervix and perineum, and sometimes even rupture of the uterus, and in the child asphyxia and cerebral hæmorrhage. Pituitrin is used after delivery for intestinal distention and retention of the urine. Combined with ergotol, it is given in cases of postpartum hæmorrhage and during cæsarean section. It should never be used in the first stage of labor nor in any stage if the case is normal. Neither should it be used to induce labor at full term, although it may be employed to hasten the termination of an inevitable abortion.

It should never be used in doubtful cases, and only small doses should be given even when its use is certainly indicated.

F. H. HARMS.

Bjornson, O.: The Use and Misuse of Forceps in Labor. *J.-Lancet*, 1919, xxxix, 579.

A narrowing or deformity of the pelvis is comparatively rare as an indication for the use of forceps. The same is true to a certain extent of crossbirths, brow, face, and difficult breech presentations, eclampsia and placenta prævia. Lesser complications more frequently met with are delayed labor due to failure of the head to enter the pelvic inlet. This may be the result of malpositions (such as the occipitoposterior position); disproportion between the head and the pelvis, misdirection of the uterine force (as in over-distention of the uterus from hydramnios), multiple pregnancy, or laxity of the abdominal wall due to over-distention or separation of the recti muscles. After the head has descended into the pelvis delay results from posterior position of the occiput and disproportion between the head and the pelvis. Lastly there are cases in which, owing to slow dilatation of the os, increased resistance, or obstruction to the advance of the head, the uterine forces give out and uterine inertia results.

Certain conditions must be present before instruments should be applied:

1. The head must present by the vertex.
2. The head should be engaged, i. e., the greatest diameter should have passed the pelvic brim.
3. The os uteri should be fully dilated. Nothing could be more pernicious than applying forceps and pulling the head through a partly dilated os.
4. The membranes should be ruptured and retracted over the head.
5. Uterine contractions should be present in sufficient force and regularity to ensure detachment of the placenta and closure of the uterine sinuses as otherwise a serious or fatal hæmorrhage is apt to follow.
6. The occiput should be directed anteriorly. This last is not usually given in the textbooks, but many of the difficulties of the forceps operation would be obviated if the rule were followed.

Premature administration of chloroform is apt to lead to error. It is safest never to administer a general anæsthetic unless the conditions necessitating the use of forceps are present. For pain it is better to give morphine, chloral, or hyoscine instead.

The author prefers the Neville type of forceps. He places the patient in the Sims' position and insists that the obstetrician should wear rubber gloves. Such experience as he has had with high forceps has been unfortunate. Attempts to push the head into the pelvis by suprapubic pressure do no harm and sometimes succeed. When the abdominal wall is lax a tight abdominal binder applied between pains is often of aid. When these means fail resort may be had to forceps of the axis traction type. Applying forceps to a floating head and giving a few pulls to see what happens does no harm, but labor must not be finished in this way if there is absolute immobility and no response to the traction. The

lone practitioner would do a version or, if help were available, a craniotomy or cesarean section.

When the head is in the pelvis the delay in the great majority of cases is due to the posterior position of the occiput. Textbooks state that this position occurs in about 20 per cent of all labors, but in one series of cases the author found it in 50 per cent. In either the cephalic or pelvic application of the blades there is difficulty in getting them into position, and even after they seem to be in place the handles refuse to lock. The occipitoposterior position is often not diagnosed until these difficulties are experienced. Often a stony immobility is felt and after useless tugging the forceps slip. Instead of applying the forceps to the occipitoposterior position the occiput should be rotated to the front with the hand opposite the side toward which the occiput points. If the fontanelles cannot be felt, feel for the ear. The head should be grasped with the thumb and four fingers. To avoid the rotation of the occiput back to its old position the back may be rotated to the front by placing the four fingers over the child's shoulder blade and the thumb over the clavicle and rotating the back to the front. This manœuvre is impossible only when the membranes have been ruptured a long time and the uterus is firmly contracted on the child's body. The occiput may be rotated and held by an assistant until the forceps are applied. After a pull the shoulders will take care of themselves. Rotation of the child on its long axis is very much easier than the podalic version advised in the textbooks.

In the less frequently occurring partial disproportion between the head and pelvis in occipito-anterior position, in which the os is dilated, the head has descended into the pelvis sufficiently to become fixed but reaches the mid-plane or even lower, the uterus tires out, and progress ceases, the use of the forceps is indicated plainly. To help a tired uterus that still has the power to contract and retract is good obstetrics, but to extract a child from an exhausted uterus which has not that power is to expose a woman to a severe hæmorrhage. The same is true also when the head has reached the perineum.

F. H. HARMS.

Harrar, J. A.: Median Episiotomy in Primiparous Labor. *Am. J. Obst.*, 1919, lxxx, 705.

In the New York Lying-In Hospital definite lacerations of the lower birth canal which require repair occur in about 44 per cent of all primiparous labors and in about 10 per cent of all multiparous labors.

Undoubtedly in certain primiparæ in whom no surface laceration is found on careful examination there may be a break in the continuity of the deeper structures involving the fascia and muscles and their attachments. It must be admitted also that in a good percentage of the cases of primiparæ who have normal labors the vagina remains sufficiently intact for all functional and mechanical purposes. In regard to these cases the author considers the ques-

tion of whether or not a better end-result would be obtained by doing an episiotomy before the stretching has reached its full extent.

Not infrequently episiotomy will obviate the indication for the low forceps operation. If laceration of the perineum impends, a jagged or transverse splitting or butterfly tear is prevented by a single, straight, clean-cut incision. By turning the lower end of the incision away from the anus injury to the sphincter ani is avoided. If despite good pains the vulva is holding the head on the perineum, the performance of a properly timed episiotomy will prevent serious asphyxia of the child from prolonged pressure on the head with its attendant cerebral hæmorrhage.

The simple median episiotomy may be employed only during the perineal stage of labor and should be done with the ordinary light blunt-pointed cervical scissors curved on the flat. The forefinger being placed in the vagina during a pain, a tense band, corresponding to about the location of the hymenal ring, will be felt about $\frac{1}{2}$ in. inside the distended margin of the perineum. The anus should then be pressed to one side with the middle finger and the thumb and the scissors introduced with the curve pointing in the opposite direction. The incision should be begun in the midline, the tissues of the urogenital septum being severed in the median raphe for about $\frac{3}{4}$ in. It is desirable that the incision extend further on the vaginal than on the skin surface of the perineum. As the scissors close, the incision will curve slightly away from the anus.

This swerve made at the lower end of the incision will meet the chief objection to median episiotomy raised by those advocating the lateral incision who have much to say on the danger of the extension of the median cut into the sphincter ani. If more room is required or if the levator ani is not well dilated and it is necessary, notwithstanding, to make an emergency delivery, the incision should be continued into the pararectal space. The incision is best made by successive snips rather than by one cut.

Repair may be effected satisfactorily with a few sutures of twenty-day chromic gut, and the margins of the wound brought together with interrupted or continuous subcuticular sutures of the same material. Unless the incisions are very small it is best to do the repair after the completion of the third stage of labor.

EDWARD L. CORNELL.

Turner, C. E.: The Advantages of Nitrous Oxide-Oxygen in Labor. *Am. J. Obst.*, 1919, lxxx, 670.

The author does not believe that the administration of gas diminishes the frequency or force of uterine contractions. Disturbances of the cardiovascular function he believes are due to the fact that the analgesic line has been passed.

During the administration of the gas the condition of the fetal heart should be examined every half hour. If the nitrous oxide has been properly ad-

ministered, the lying-in period runs a most favorable course and convalescence is rapid.

The use of other remedies in connection with analgesia is also of importance. During the first stage of labor morphine is the ideal sedative. It should not be given late in this stage nor early in the second stage because it is then apt to harm the infant. Therefore the nurse should be instructed to give it four to six hours before the expected delivery.

Turner advises the administration of ether when complete relaxation is desired. This applies particularly to the use of the forceps.

Analgesia affords no protection against lacerations of the cervix or vaginal walls.

EDWARD L. CORNELL.

PUERPERIUM AND ITS COMPLICATIONS

Bill, A. H.: Observations on the Problem of Hæmorrhage in Obstetrical Cases. *Am. J. Obst.*, 1919, lxxx, 708.

The maternal mortality in cases of antepartum hæmorrhage including placenta prævia and complete separation of the normally situated placenta has been unnecessarily high and postpartum hæmorrhage needlessly frequent, though not as a rule fatal. More definite precautionary measures would reduce the mortality of the former and the frequency of the latter.

Since the more general adoption of cæsarean section for delivery in cases of placenta prævia and accidental separation of the placenta, the maternal mortality has been much lower than when the older methods, such as *accouchement forcé*, were used. Abdominal hysterotomy is therefore to be strongly recommended.

In the type of case under discussion postpartum hæmorrhage is almost certain to result as even in the absence of deep laceration of the cervix or injury at the placental site of the uterus there is relaxation of the uterus due to the previous loss of blood. The only way to restore the lost tone to the uterus and to control the bleeding is to introduce blood into the circulation.

The transfusion should be begun before the delivery and, as nearly as possible, carried on simultaneously with it. Transfusion should be given early if in the physician's judgment the patient has lost so much blood that the further unavoidable loss which will occur with delivery will in the least endanger her life.

Recently the author has made a routine practice of administering pituitrin during the third stage of labor, and the results in more than 1,000 cases treated in this way were most satisfactory. The contrast between the amount of bleeding in these cases and in those in which nothing was administered during the third stage of labor is very marked. In fact, cases of real postpartum hæmorrhage are now practically unknown when conditions are otherwise normal.

EDWARD L. CORNELL.

Boorstein, S. W.: Obstetrical Paralysis (Erb's Palsy); With a Report of Seventeen Cases. *Med. Rec.*, 1919, xcvi, 790.

In all forms of flaccid paralysis a great deal can be accomplished by orthopedic methods if treatments are begun early and contractures are prevented.

The author discusses in detail the pathology, etiology, roentgen-ray findings, and diagnosis.

In describing the treatment he divides his cases into those which require operation and those which do not. For cases in which the upper arm is involved, support, massage, and exercise are generally sufficient if the condition is taken in time, but if treatment is delayed operation becomes necessary to correct contraction deformities. When the lower arm is involved operation is usually necessary for the repair of the plexus. Even in these instances, however, conservative treatment may be tried for a short time before resort is had to operative measures.

To prevent contractures of paralyzed muscles, the arm should be put at rest in such a position that the stronger muscles cannot contract. This may be done by holding it in a plaster cast or by the application of a light wire splint. The arm should be abducted to a right angle with the torso or perhaps a little elevated so as to relax the injured nerve. The limb should be rotated outward and the forearm supinated. The hand may be tied to the upper end of the bed. Massage and exercise are of the greatest importance and if possible should be used daily. Subluxation and dislocation should be reduced. If contractions are present at the shoulder forcible stretching under anesthesia may be tried. For the repair of obstetrical injury to the brachial plexus operation is often necessary.

The author's conclusions are as follows:

1. Obstetrical palsy belongs to the domain of orthopedic surgery as does any other congenital deformity of a limb.
2. Obstetrical palsy should be treated according to the same principle as anterior poliomyelitis; and deformities should be watched for and prevented.
3. The weak muscle should be carefully watched and overstretching and over-use avoided.
4. The shoulder should be put in a splint or brace immediately in order to prevent stretching of the deltoid, to allow absorption of hæmorrhage, and to provide for repair of the damaged nerves.
5. In most cases the injuries to the nerves are not severe and early treatment will effect a cure.
6. About three months should be allowed for conservative treatment. If at the end of that time there is no marked improvement, operation on the plexus is indicated.
7. Conservative treatment consists of proper support, massage, and exercises. Electricity is of no value.
8. Taylor's operation on the plexus is very beneficial and should be performed if conservative treatment fails.

9. The contracted pectoralis major, subscapularis, and teres major should be cut by Sever's method if successful results are to be obtained.

10. A patient suffering from this affection should be under proper observation until he is at least 10 years old as slight deformity may persist.

L. C. DONNELLY.

McPherson, R.: The Care of the Bowels during the Puerperal Period: A Further Report. *Am. J. Obst.*, 1919, lxxx, 698.

The patients were placed alternately in Wards A and B as they came from the delivery room. Those in Ward A were not given any catharsis, while those in Ward B received the usual cathartics given in such cases. If no bowel movement occurred in the non-catharsis cases, a low saline enema was given at the end of the third day. The bowels were then not disturbed until another three days had passed, when a second saline enema was given. These enemata were continued every three days until the patient was discharged from the hospital.

Nine hundred patients were given routine catharsis, and 911 no catharsis. Of the 900 who had catharsis, 84 at one time or another during convalescence developed a temperature of 100.4 degrees twice during twenty-four hours.

Of the 911 to whom no catharsis was administered, 53 developed the same temperature at the same time. In other words, in approximately 1,000 cases of each type the febrile morbidity of those to whom no catharsis was given was about one-half as great as that of those to whom catharsis had been given.

The author emphasizes the danger and uselessness of routine drugging and warns against the practice of attributing certain effects to certain definite conditions when there is no adequate proof of any relationship between the two.

EDWARD L. CORNELL.

NEW-BORN

Boero, E. A.: The Survival of the Fœtus in Cases of Prolapsed Cord without Pulsation (*Supervivencia del feto en los casos en que el cordón pro-cidente no late*). *Semana méd.*, 1919, xxvi, 594.

Boero reviews an article by Balard in which it is shown that the fœtus may be alive even though no pulsations can be felt in the prolapsed cord and no pulsation of the heart perceived by auscultation. He quotes five of Balard's conclusions and states that he and other obstetricians can confirm his findings. In one instance he found a living fœtus in a case in which there was no pulsation of the cord and the auscultation findings were negative. In addition he has had the disagreeable experience of extracting by cranioclasia a living fœtus which he had believed to be dead because of negative auscultation findings and the absence of pulsations in the cord.

For several years, therefore, Boero has examined the child's heart directly by manual intra-uterine

contact. When the pulsations of the heart cannot be heard by auscultation, he applies his finger to the precordial or epigastric region of the fœtus and thus is able to feel even the slightest contraction. This method of exploration requires an ample natural or artificial dilatation of the cervix but its great importance as a diagnostic measure cannot be questioned. It has enabled Boero to save more than one fœtus believed to be dead, and has given him absolute assurance that he will not do an embryotomy on a living child.

M. M. MATHIES.

MISCELLANEOUS

Demelin, L.: The Justomino Pelvis (*Le bassin "mineur"*). *Rev. franç. de gynéc. et d'obst.*, 1919, xiv, 273.

The author describes the justomino type of contracted pelvis as of two varieties, the adult and the infantile, according to whether the form is that of an adult woman or resembles the pelvis of the child.

A woman with a justomino pelvis is not a dwarf nor of the rachitic or achondroplastic type. She is usually well formed but has a narrowness of the hips which gives her a masculine appearance. On internal examination the entire contour of the pelvis can be reached and its conjugate diameter is found to be about 9 cm.

The author gives a number of diagrams with dimensions showing the differences in the various types of justomino pelvis as compared with the normal.

Very frequently the osseous hypoplasia is associated with important modifications of the soft parts as well, such as infantilism of the vulva, narrowness and shortness of the vagina, hypoplasia of the uterus, etc. Pregnancy may be interrupted before term owing to the restriction of space in the uterus. This may be repeated, but the interval between conception and expulsion is increased each time so that eventually a mature child may be born.

The obstetrician is often deceived by the normal form of this type of pelvis. However, while the child's head is able to pass into the pelvic canal, it remains above the brim and it is impossible to deliver it with the forceps.

When the condition is diagnosed early various courses may be followed. Interruption of the pregnancy at the end of the eighth month has its advocates but the author believes that on account of the slowness of the dilatation and other causes this has more disadvantages than advantages. In his opinion a cesarean operation at term is much better. If the obstetrician is compelled to make delivery by the natural route, however, the forceps rather than version should be chosen as it is impossible to reduce the dimensions of the cephalic ovoid by engaging it in the suboccipital bregmatic diameter.

In discussing the pathogenesis of the justomino pelvis the author states that he believes it to be a

dystrophia of endocrine origin, especially of the failure of the hormones of the thyroid and thymus in foetal and early life.

W. A. BRENNAN.

Foote, J. A.: Legislative Measures against Maternal and Infant Mortality: The Midwife Practice Laws of the States and Territories of the United States. *Am. J. Obst.*, 1919, lxxx, 534.

In the United States the General Medical Board of the Council of National Defense appointed a Committee on Infant Welfare which in turn named a Committee on Midwife Practice (1918). This committee, consisting of Dr. Taliaferro Clark, of the United States Public Health Service, Dr. J. Whitridge Williams, Dean and Professor of Obstetrics, Johns Hopkins Medical School, and the author, believed that a survey of the existing laws enacted by various state legislatures would be of value in determining what additional remedial measures would be necessary to improve the present situation.

There is no uniformity of law or even of required standards. The establishment of competent and reliable teaching centers to educate women in this work seems hardly possible, even if it were desirable. The ideal regulation seems to be that in which the midwife is told many things which she must not do and is placed in the position of a more or less well-trained obstetrical assistant. Williams believes that community centers, even in rural districts, with paid physicians as supervisors and well-trained obstetrical visiting nurses as educators,

would solve the problem of the midwife and her training. With a supervising nurse to counsel her and watch her and a physician to make a preliminary examination who is available in case of need, the midwife would cease to be a practitioner of medicine and surgery menacing the health and the life of the mother and child, and would occupy a definite place and fill a definite need in the scheme of social welfare in every community.

The regulations prescribed by the Commissioner of Health of New York City are perhaps the best midwifery laws now in force. To apply this set of rules to smaller or rural communities, however, it would be necessary to modify it in its details, though not in its essentials.

Uniform legislation for the enforcement of birth registration and ophthalmia prophylaxis, for proper inspection of the midwife by both the Health and Police Departments of the city or state, and for the prohibition of unsupervised obstetrical practice by any midwife however theoretically qualified, are the minimum essentials in which all state and city laws should be in complete uniformity. These, in the main, were the recommendations in the unpublished report of the Sub-Committee on Midwife Practice, recommendations which were based partly on the somewhat negative findings of the foregoing digest of laws, but more largely on the long study and experience of Dr. J. Whitridge Williams in community obstetrics and Dr. Taliaferro Clark's facility in dealing with problems of public health.

EDWARD L. CORNELL.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Dederer, C.: Autotransplantation of the Kidney. *J. Am. M. Ass.*, 1919, lxxiii, 1836.

Dederer succeeded in transplanting the left kidney of a dog into the neck, uniting the renal artery with the common carotid and the renal vein with the external jugular. Two weeks later, a right nephrectomy was performed. The dog lived for more than four months, and died as a result of hydronephrosis. The signs of the developing hydronephrosis were characteristic; there was an apparent enlargement of the kidney in the neck and hypertrophy of the ureter evidenced by a strong squirting of the stream of urine. H. W. PLAGGEMEYER.

Braasch, W. F., and Carman, R. D.: Renal Fluoroscopy at the Operating Table. *J. Am. M. Ass.*, 1919, lxxiii, 1751.

While it is true that large numbers of renal stones are easily diagnosed and removed, the stones that are small and flat, especially those deep in a calix or projecting into the cortex, offer difficulty both in diagnosis and treatment. Even with the aid of pyelography it may be impossible to differentiate extrarenal stones which are obscured by the pelvic outline, to identify small stones when the pelvic outline is normal, and to differentiate between calcareous patches in the kidney cortex and actual kidney stones.

The roentgenogram and pyelogram usually afford accurate data as to the location of a renal stone, but often fail in disclosing whether the stone is free in the upper calix, has become impacted in the end of a calix, or projects into the cortex. When the presence of a renal stone is definitely proved, the stone may be difficult to locate, especially if it is situated at the bottom of a calix, if walled off by inflammatory or cicatricial tissue, or if palpation is rendered difficult by the venous congestion of the kidney consequent to delivery. Needling and cortical incisions, which are often resorted to in these cases, may cause considerable destruction of the kidney tissue as well as increase the danger of subsequent hemorrhage. What appears to be a single stone may actually be two or more stones lying close together or overlapping each other and what is apparently a large branched stone may actually be a small distinct stone. Moreover, a large stone may form an outline that suggests several smaller stones. In such cases, even after considerable search, there may be a doubt in the surgeon's mind as to whether any stones remain in the kidney. The removal of one stone that conforms to the roentgen shadow may seem all that is necessary.

There is a possibility that fragments of the stone may have broken off, or that portions only loosely

connected with the original stone are left. This is especially apt to occur in cases of soft stones, when the ends are impacted in the calices, and when putty-like masses of crystals adhere to the stone. Because of these difficulties surgery for renal lithiasis has often been unsatisfactory. Many so-called cases of recurrence of renal stone are due to incomplete removal at operation. A roentgenogram after operation will establish the presence of fragments or stones, but places the surgeon in the embarrassing situation of advising further surgery which will be more difficult than the original operation.

Fluoroscopic examination of the kidney brought out of the incision is a more accurate method of examination. The apparatus recommended is practically the same as that used in the army base hospitals except for certain minor changes necessary to adapt it to civil practice. The unit is small and compact, occupying less than 2½ sq. ft. of floor space, and is operated from an ordinary lamp socket without special wiring. The fluoroscopist having first secured dark-room accommodation of his eyes by the preliminary wearing of smoked glass goggles will be able to indicate with a sterile metal-tipped pointer any stones or fragments remaining in the kidney, or pronounce the kidney free from foreign bodies. R. L. LATCHEM.

Kretschmer, H. L.: The Diagnosis of Ureteral Calculi. *Surg. Clin. Chicago*, 1919, iii, 1503.

Many shadows in the ureteral area which in the beginning of roentgen-ray diagnosis were attributed to stones, were found upon operation to be due to other causes. This source of error was largely eliminated by using shadowgraph catheters which proved the suspicious shadows to be of extra-ureteral origin. There still remained, however, a small group of cases in which, though the shadowgraph catheter and the shadow were apparently side by side, it was impossible to state definitely whether or not the shadow was caused by a ureteral stone.

To reduce the possibility of error in these doubtful cases it is now the custom to have stereoscopic roentgenograms taken. The author's method of diagnosis in this type of case is as follows:

"In a given case of suspected stone the shadowgraph catheter is passed and the patient taken to the X-ray room where a double exposure is made on a single plate with a shift in the tube."

In cases of stone in the ureter both exposures will show the shadow of the stone and the shadow produced by the shadowgraph catheter lying side by side. When the shadow-producing body is of extra-ureteral origin and in the same plane as the catheter, the first exposure will again show the two

shadows lying side by side, but the second exposure will show a definite space between them.

The author calls attention also to the retrograde movement of ureteral calculi, citing instances in which stones have migrated from the lower end of the ureter even as far as the kidney.

Non-operative procedures should be used to dislodge and remove the stone whenever possible, and operation is indicated only when it is certain that the stone cannot be removed by this means. Because of the danger of peritonitis, the operation should always be extraperitoneal, never intraperitoneal.

J. P. O'NEIL.

BLADDER, URETHRA, AND PENIS

Padua, R. G.: Cystolithiasis among Filipinos in Association with Dietetic Deficiency.
Phillipine J. S., 1919, xiv, 481.

Osborne and Mendel in a series of dietetic experiments on lower animals found phosphatic calculi in the urinary passages of rats that had been subjected to a ration of inadequate nutritional value. As a result of these findings, the author carried on a twofold investigation: (1) to show the possible application of this hypothesis to a people collectively noted for an unbalanced, essentially avitaminic diet such as that common in the Philippines; and (2) to discover the chemical composition of vesical calculi in Filipinos.

The ordinary daily ration of the Filipino masses consists principally of rice vegetables in moderate amount, and very little meat or fish. The rice is at times so improperly prepared that most of the pericarp, where the vitamins are supposed to be, has been removed. This almost exclusively vegetarian diet, low in phosphorus and protein, may result in diseases of metabolic or nutritional deficiency, such as beriberi.

Fifty-eight cases were studied. Of the first 48 the author had no personal knowledge as the histories were taken from hospital records and the calculi obtained from the museum. In the last 10 cases, however, the patients were studied by the author from their entrance into the hospital until their discharge. The clinical history records of the entire 58 cases were collected and the essential points condensed. The patients were Filipinos of different ages, sex, social condition, occupation, etc. Except in the last 10 cases the history of beriberi was unreliable. Fortunately, most of the hospital records showed the degree of bodily development and nutrition. On admission most of the patients were of relatively low vitality, as was shown by their prolonged convalescence after operation.

The series of cases is divided into 4 groups: Group 1, eleven patients giving positive signs of beriberi; Group 2, eighteen patients with no reliable history of beriberi, but undernourished and belonging to the poorer class; Group 3, twenty-three patients who were well developed and well nourished; and Group 4, six patients regarding

whose nutritional condition the author had no knowledge.

The calculi were cut in approximately two equal parts, one-half being used for analysis and the other being returned to the museum. The various layers of the stone were then peeled off and each layer was weighed individually, the total weight of the stone being computed. Each layer was then ground to a powder, a small amount of which was dissolved by the aid of gentle heat and dilute hydrochloric acid. After filtration of the solution 2 drops of the filtrate were put on a slide and subjected to the action of ammonia vapor beneath a shallow glass container for about fifteen or twenty minutes. The crystal or sediment formation was then examined and identified under the microscope.

It should be recalled that in the presence of a binding substance a stone is formed around a nucleus, and that the nucleus may be a mass resulting from an inflammatory process of the vesical mucosa, such as pus, blood, or bits of necrotic tissue, foreign bodies, such as fragments of bougies, pins, silk sutures, or a stone formed previously in the kidney or earlier in the bladder, around which other layers of stone have been formed which have the same or a different chemical composition.

The layers of various chemical substances in a bladder stone may be due to a change in the composition of the urine secondary to a modification of the general metabolic processes. According to Sondern, the abnormal condition during which the nucleus is formed may be temporary and the stone may continue to grow in size even if normal urine is excreted. Once the nucleus is formed, the tendency is toward a more or less continuous deposit of practically the same chemical substances in almost the same proportion. It is possible, however, that with the decline of health usually secondary to faulty metabolism and nutrition, unfavorable fermentative changes may take place within the bladder, causing the formation of a second layer of stone of distinct chemical composition and thereby making the primary calculus the nucleus of a second stone. Still other changes may occur and a third layer of different chemical composition may be formed. Consequently, for a given stone there are as many stone formations as there are layers, and these may or may not be physically and chemically distinct from one another.

The percentage of primary phosphatic calculi (nuclei) as determined by these tests was greatest in Groups 1 and 2, being 45.4 and 72.2. Primary urate calculi were found most frequently in Group 3, the percentage being 43.5. In Group 4 phosphatic composition predominated.

As a whole, the total phosphatic estimates give an incidence of more than 50 per cent in the total number of calculi among Filipinos. It is apparent, therefore, that the inadequate dietetic conditions and concomitant nutritional disorders, such as beriberi, among Filipinos favor the formation of phosphatic stones.

J. P. O'NEIL.

Kolischer, G., and Eisenstaedt, J. S.: Lesions of the Female Urethra: Demonstration of Four Cases. *Surg. Clin. Chicago*, 1919, iii, 1499.

In this clinic there were presented four very interesting cases of urethral lesions in women. In the first case the diagnosis was neuro-angioma; in the second, angioma cavernosum; in the third, angiosarcoma; and in the fourth, inflammatory granuloma of gonorrhoeal origin with fissure formation.

The question of the treatment of the tumors in the first three cases is discussed. The indication for surgical removal in all was identical. Removal with the knife and closure with suture, however, often may be a difficult and tedious task and followed in many instances by multiple and rapid recurrences. On the other hand, the destruction of these growths by the actual cautery is an easy matter and if done thoroughly gives lasting results. Whether the cauterization should be done by actual cautery agents, by means of the Paquelin cautery, the galvanocautery, or by fulguration is a matter of choice. To prevent recurrences of angiosarcoma cauterization should be followed by radiotherapy.

In discussing the fourth case presented the authors state that as long as the granulations and ulcerations in the mucosa persist in this condition infection will be maintained and therapy, therefore, must be radical. They advise the scraping of the granulomata with a sharp curette through an endoscopic tube and the thorough cauterization of the ulcerations with a fine galvanocautery.

H. L. KRETSCHMER.

GENITAL ORGANS

Watson, M. E.: The Colliculus Seminalis at Birth. With a Report of the Origin, Development, and Local Distribution of Its Gland Tubules. *J. Urol.*, 1919, iii, 269.

Serial sections of the colliculus seminalis and adjacent posterior urethra of a male infant at birth were made and studied. Four reconstructed drawings with photomicrographs of cross sections of the verumontanum illustrate the article.

The first evidences of the development of the collicular elevation are three narrow ridges on the floor of the posterior urethra which begin just outside the internal vesical sphincter. These are composed of connective-tissue bands. They gradually increase in height until when 0.3 mm. in length they fuse and form the upper extremity of the verumontanum. At this point they are 0.1 mm. high. The prominence thus formed increases both in height and breadth until at the point of greatest dimensions it measures 4 mm. long, 1 mm. high, and 1.5 mm. wide. It terminates in three ill-defined ridges, the inferior striæ, which decrease in size and finally become a part of the floor of the posterior urethra.

The verumontanum is made up of the prostatic utricle with its opening on the summit and the ejaculatory ducts on either side opening into the

urethra. In the substance of its posterior and middle thirds are many tubular glands. The study here reported is concerned principally with the origin and arrangement of these latter glands which may be classified into three groups: (1) those of mucous membrane origin, (2) those of prostatic origin, and (3) those arising from the sinus pocularis or prostatic utricle.

The first group of glands are found in the upper third of the organ, arising immediately beneath the union of the superior striæ. They follow a course through the verumontanum almost parallel to the posterior urethra to a point about the middle of the prostatic utricle where they open into the prostatic urethra through the sides and top of the verumontanum. They are located near the surface of the organ with their blind ends pointing toward the bladder. Twenty-six tubules of this type were found. These glands are the first developed, being present by the fourteenth week of foetal life.

The second group of glands occupy approximately the middle third of the organ. They are the largest of the three and have an extensive distribution. Their blind ends are situated well within the deeper substance of the verumontanum and course upward. The majority open along the sides of this structure, a few along the midline. The orifices of the latter are in front of the openings of the utricle and ejaculatory ducts. These tubules extend further forward than any of the others. Twenty-eight of these tubules were found. These glands can be recognized by the sixteenth week of foetal life.

The third group of glands arise from the evaginations of the walls of the utricle. Of the three groups these are the smallest and their walls and lumina are the most irregular. Their long axis is practically parallel to the floor of the urethra, and their blind ends are directed toward the bladder. They open into the utricle. These glands are confined for the most part to the anterior part of the utricle. A few, however, are situated in its middle portion. There are none in the posterior third. They are located principally beneath the utricle in the midline as only a few are found and open on the sides of this organ. Twenty of these glands were discovered. These glands appear by the twenty-fifth week of foetal life. By the thirty-first week the prostatic utricle has opened into the urethra.

H. G. HAMER.

Heitz-Boyer: Prostatectomy by the High-Frequency Current (Prostatectomie par la haute fréquence). *Presse méd.*, Par., 1919, xxvii, 616.

Heitz-Boyer reports the first results of the employment of the high-frequency current for prostatectomy. As early as before the war he performed a prostatectomy in this way by the natural routes in 3 cases. In 2 more recent cases, using first the air, and then the water urethroscope, he destroyed the median lobe in beginning prostatic hypertrophy. During 1919 he used the method through the open bladder in 12 cases, in 3 of which the general condition was very poor and the prostate very large.

The object of the method is to eliminate the great complications of Freyer's operation, hæmorrhage and infection, which are facilitated by the large absorbing surface formed by the site of the prostate after enucleation. In the Heitz-Boyer procedure there is practically no hæmorrhage as the current causes hæmostasis, and there is no absorbing surface as coagulation occurs in the site of the prostate.

In the first case here reported, which was operated upon more than five months ago and in which the prostate was very large, complete evacuation of the bladder is now possible and posterior urethroscopy demonstrates complete repair of the prostatic urethra.

The indications for the new method cannot yet be given definitely, but the procedure widens the limits of operability as it may be used in the treatment of those whose condition will not permit them to withstand the Freyer operation.

W. A. BRENNAN.

Jackson, H.: Chorio-Epithelioma of the Testis, with Report of a Case. *J. Am. M. Ass.*, 1919, lxxiii, 1868.

The subject of chorio-epithelioma in the male has been little understood until recently and no doubt many cases have been overlooked, especially in America. The author's case is the first to be reported in the Middle West.

Marchand's dictum that chorio-epithelioma occurs only in the female in connection with pregnancy has been responsible for the failure of both pathologists and surgeons to recognize the condition in the male. Schlagenhauser was the first to prove the occurrence of a tumor of this kind in the testicle (1902). Since then, the author has collected 81 cases from the literature and has added one of his own.

The condition may be suspected clinically in young adults in cases of so-called "mixed tumor" of the testis when, on cut section, masses resembling recent and old blood clot are found associated with cartilage, bone, cysts, etc. (teratoma).

The pathogenesis of foetal tissues in the male, and especially of cells derived from the chorion, is obscure. More recently it has been explained as the development parthenogenetically of an undeveloped sperm cell, or the latency and late growth of an isolated blastomere that is carried over from the ovum in the anlage of the testis.

Pathologically the gross appearance of chorio-epithelioma is that of recent and old blood clot with grayish trabeculation. This is associated with a teratoma showing different types of tissue, especially cartilage and glandular tissues. Often the growths are cystic and they may show portions of organs. As a rule they are well circumscribed and grow slowly for months or years until suddenly they become malignant and grow more rapidly, producing metastases. In two reported cases the breasts hypertrophied and secreted colostrum.

The trabeculæ show cells that are typical of those found in the layer of Langhans and the syncytium of

the chorion. Metastases, which occur by way of the venous system, are most commonly found in the lungs and liver. In late cases with such metastases there may be cough, loss of weight, and bloody expectoration simulating tuberculosis. The enlargement in the scrotum is then looked upon as a secondary tuberculous involvement. The tumor may also be regarded as sarcoma because of the blood content, or as a mixed tumor because of the different cellular elements of the teratoma.

Over 80 per cent of the tumors of the testis are teratomatous in origin. The term "mixed tumors" should be discarded. An X-ray of the lungs in cases in which metastases have formed reveals multiple rounded and well-defined shadows of varying diameters.

The finding of a tumor mass in a teratoma which on cut-section resembles old and fresh blood clot is pathognomonic of chorio-epithelioma.

In cases of tumor in the scrotum with hæmoptysis and loss of weight the possibility of metastases from a chorio-epithelioma or sarcoma should be considered before making a diagnosis of tuberculosis.

The author's case was that of a man 23 years of age. About three years previously the patient had noticed a small hard nodule near the upper pole of the right testis which gradually grew larger till it attained the size of a hen's egg. It was painless and never reducible. About three months ago the mass suddenly grew much more rapidly and at the time of examination it was the size of a grapefruit and tender to the touch. The patient had lost 5 lbs. in weight within the last month and had noticed shortness of breath and slight hæmoptysis within the past week.

The tumor mass was removed under general anæsthesia as it was well encapsulated within the tunica albuginea. It had completely obliterated the testis and epididymis. The wound healed by primary intention. In the course of the next three weeks the respirations became more rapid and labored and death occurred with symptoms of oedema of the lungs.

Autopsy showed marked pulmonary oedema and the presence of about forty hæmorrhagic, friable nodules varying in size from that of a hazelnut to that of an English walnut scattered throughout both lungs. One similar nodule was found on the anterior surface of the liver.

Microscopically sections taken from various parts of the main tumor mass revealed areas of cartilage intermixed with areas of connective tissue and cysts lined by flat and cylindrical cells. The cysts were quite numerous and many of them microscopic in size. The connective tissue was lymphoid in character. In one area were large spindle-shaped cells with little or no stroma. In other areas the tissue was myxomatous and in the central portions was undergoing necrosis. There were numerous blood vessels throughout the section.

Sections taken from the hæmorrhagic areas revealed blood cells, some fairly well preserved, others in

various states of degeneration. Interlacing the areas of blood cells were many bands of fibrin of varying thickness. Toward the periphery were bands of fibrous tissue infiltrated with round cells upon which lay a tissue that was characteristic of the chorio-epithelioma seen in the female. Surrounding the numerous wide blood spaces of this region were cells composed of nuclei which varied in size and shape. Some of these were clustered together and simulated giant cells. The nuclei stained darkly and were surrounded by a vacuolated cytoplasm but no definite cell wall. They encroached upon the walls of the blood spaces and in some instances were found within the blood spaces. Beneath this syncytial tissue were cells with smaller nuclei surrounded by a vacuolated cytoplasm and a definite cell wall. These were in a papillary arrangement and resembled the cells of Langhans.

Sections from the metastases in the lungs showed a similar picture except that the hæmorrhagic areas were smaller and the syncytial areas proportionately larger.

Reel, P. J.: A Consideration of Varicocele as Applied to Men in the Navy. *Mil. Surgeon*, 1919, xlv, 688.

Varicocele should present no bar to duty at sea with the navy, though Reel pleads for a better

understanding and greater consideration of these cases.

The author divides the condition into three general types: (1) varicocele producing no psychic or reflex disturbances and annoying only because of the weight and consequent traction on the cord; (2) small or medium-sized varicocele with marked nerve symptoms; and (3) medium-sized varicocele which never gives any trouble and should be left alone. In cases of the second type operative procedure is absolutely essential to obtain beneficial results.

In the surgical treatment, the author prefers the inguinal type of operation under local anæsthesia. After the cord has been isolated and a small amount of anæsthetic injected, a longitudinal incision is made through the sheath, the vas and artery are identified by sight and touch, and the veins are separated. The portion of the veins to be removed is crushed at both ends with hæmostats, ligated, and excised. The stumps are then transfixed, tied again, and returned to the sheath. In 6 cases in which the vessels were embedded in fat a reef was taken in the veins and a bridge formed by sewing them together with a portion of the fascia underneath. Elevation of the scrotum and rest in bed for ten days are important details which reduce postoperative pain and swelling.

H. W. PLAGGEMEYER.

SURGERY OF THE EYE AND EAR

EYE

Van Duyse, G., Jr.: Colobomatous and Microphthalmic Eyes. *Brit. J. Ophthalm.*, 1919, iii, 529.

The pathologic study reported was made on the eyes of a year-old rabbit. The left eye was somewhat smaller than normal. Both showed the following changes:

1. The optic nerve was represented by a very short peduncle and the eye was entirely detached from the brain. Only the distal part of the nerve was developed; the proximal part was found to be aplastic.

2. There was a large chorioretinal coloboma below, and at this place a hyaloid mass (mesodermal tissue) formed a crest in the vitreous chamber around the hyaloid artery. About this crest the retina was formed irregularly and in some places several layers of the retina were clearly visible. For the most part, however, the cells were without arrangement and embryonic. Posteriorly in one eye a part of the retina had been herniated and had formed a cyst.

3. The lens occupied practically all of the rest of the vitreous chamber, and in each lens four nuclear arcs were seen, two of which were posterior and two anterior.

4. There was an entropion of the iris, the pupillary margin being curved in and backward, thus covering the pigmented border. There was also a large coloboma of the iris.

T. D. ALLEN.

Bell, G. H., and Tousey, S.: Non-Operable Tumor of the Orbit and Brow Treated Successfully with Radium. Report of a Case with a Few Remarks. *Arch. Ophthalm.*, 1919, xlviii, 531.

The patient was a woman 65 years of age who about nine months previous to her appearance at the clinic had received a blow on the forehead. Subsequently a lump had appeared which at times was painful. Although Wassermann tests were negative, she had been given antisyphilis treatment for six months.

At the time she came to the hospital she had an enormous tumor of the orbit and brow. The cornea was ulcerated and perforated and there was bleeding from the mass of the tumor. The entire orbit was filled with the growth, the lids were greatly swollen, and the cornea could be seen projecting between the lids.

The Wassermann test was again negative. The X-ray findings indicated a tumor mass filling the entire orbit and softening of the bone in parts of the orbital walls.

Applications of 20 mg. of radium salt of two million activity were made. The radium was enclosed

in a sealed glass tube which was enclosed in an aluminum treatment tube. The aluminum tube was then wrapped in a lead wrapper about 1/50 in. thick and placed in the soft rubber cover from an Oberlander urethrometer. For treatment the tumor was divided into points 1 1/2 in. apart. The radium was left in each point for one hour at a sitting. At first the growth was so large that there were six such areas.

Two weeks after the first treatment a shriveling of the skin was noted. The tumor then began to subside quickly, the decrease in size being so rapid that toward the end of treatment the radium was applied to only two areas. At no time were there any cutaneous reactions. The first treatment was given Dec. 19, 1917, and the patient was pronounced cured April 1, 1918. At the latter date the shrunken globe that remained was removed under local anæsthesia.

The cosmetic result with the use of prosthesis was perfect. No laboratory report is offered, however, as the patient was so weak that it was thought best not to subject her to the added operation necessary to procure a specimen. The authors are confident, however, that they were dealing with a sarcoma.

Mention is made also of the use of radium in eye conditions by others. The work of Aikins in cases of rodent ulcer, vernal catarrh of the eyelids, and exophthalmic goiter is cited, as is also that of Axenfeld who successfully treated a glioma in a child. Clark treated a sarcoma of the orbit by doing a canthotomy and after splitting the external rectus muscle inserting a tube of radium which he left in place for a period of four hours. This procedure was repeated every two weeks. A nuclear cataract which developed after six months might possibly have been due to the radium.

Five cases of leucosarcoma in which Clifford obtained good results with radium are reported. Radium is especially advised when the tumor growth is slow as in tumors of the iris.

The authors are convinced of the great value of radium in the treatment of tumors of the eyelids, orbit, and brow when syphilis can be ruled out and believe that it should be given a trial before resort is had to surgery. When syphilis and tuberculosis can be ruled out it may be used also for tumors of the iris and should be seriously considered for all other intra-ocular tumors. In the treatment of epithelioma of the eyelids radium is the best agent at hand as the dosage can be readily controlled. In spring catarrh it seems to be almost a specific. Before radium is used as a therapeutic agent, however, a search should be made for sources of focal infection.

J. S. CLARK.

Benedict, W. L.: Intracapsular Extraction of Cataracts. *Minnesota Med.*, 1919, ii, 461.

The advantages of intracapsular extraction of senile cataracts consist of comparative freedom from iritis, long periods of reaction during the absorption of retained cortical matter, few complications, and the elimination of the possibility of after-cataract. Days and weeks of time in convalescence are saved, and within a few days the patient can return to work with good vision and with visual acuity that will improve instead of becoming less acute. The method is of distinct advantage to elderly persons who bear hospitalization rather poorly and with whom time may be a factor of great importance.

The intracapsular method of extracting senile cataracts as devised by Smith, known as the Smith-Indian operation, brought about the revival of the intracapsular operation introduced by Pagenstecher in 1863 and soon afterward abandoned. Much discussion as to the advisability of this operation has been aroused in this country and in Europe, and attempts to devise safer methods of extraction have given rise to wide variations of the technique in present use. Among the new instruments devised to remove the lens by pressure or traction or a combination of the two may be mentioned the cystotome, hook, vectis, "detacher," reclinateur, spoons, glass rods, and vacuum extractor.

According to the Smith-Indian method pressure is applied to the outside of the globe. Objections to this method, which seem to have been well sustained, are abrasion of the corneal epithelium, the loss of vitreous at the side before the lens is delivered, and prolapse of the iris. The latter objection was removed by iridectomy. The danger of abrading the corneal epithelium has been decreased by the use of a delivery hook with a rounded side and blunt end, but injury to the posterior corneal epithelium causing striped keratitis still remains a factor in delaying visual acuity when considerable buckling of the cornea is necessary to express the lens. Injury to the cornea was lessened by first dislocating the lens with a reclinateur, and vitreous loss was made much less probable by using less pressure than necessary to rupture the zonula and by the use of improved lid retractors.

In 1910 Knapp began using the Kalt forceps to dislocate the cataractous lens before expressing it by the Smith-Indian method. A year later Stanculeanu reported a method of extraction according to which, after the usual section and iridectomy, the anterior capsule of the lens was grasped with a capsule forceps without teeth designed to hold the capsule without tearing it and the lens was moved from side to side and up and down to rupture the zonular attachment. The forceps was then removed and the lens delivered by pressure exerted on the globe with a spoon.

Toeroek stated that if capsule forceps instead of a cystotome are used, a hypermature cataract with thickened capsule often does not rupture, but the

zonula gives way and the lens is delivered in the capsule. To imitate this accidental delivery in the capsule he aided the rupture of the zonula by applying intermittent pressure on the globe below the cornea with a Daviel spoon, at the same time making side to side movements with the forceps. As soon as the zonula ruptured, the pressure on the cornea became continuous and followed the lens, as in the von Graefe extraction. The lens was delivered with its lower edge first. A loss of vitreous occurred in only 2 of 37 successful extractions.

The Kalt forceps was recommended to the author as being well adapted for the removal of the anterior capsule in performing the usual extracapsular extraction, and its use was begun for that purpose. In a few instances the lens became luxated and was expressed in the capsule with a Daviel spoon after the usual manner. There was no loss of vitreous and the eyes healed without incident within a very few days. The extraction of the lens in the capsule was next attempted in selected cases. The capsule was grasped with the forceps, traction and side to side movements being made. Often the intact lens was pulled successfully through the incision without the application of pressure to the globe. Quite as frequently, however, the capsule ruptured before the zonula gave way or as the lens was being delivered. It was possible to rupture the zonula more easily by applying pressure below the lens by means of a Daviel spoon after grasping the capsule than by means of side to side movements with the forceps. It was further evident that the lens could be raised slightly to engage in the wound even before the zonula gave way, and that thereby the escape of vitreous around the side of the lens was prevented. Accordingly, traction upward or toward the wound was combined with pressure on the globe below, care being taken that the traction on the capsule was not sufficient to rupture it. When the zonula gave way, the lens immediately engaged in the wound without turning or "tumbling." Pressure with the Daviel spoon was then made to follow the lens as described by Toeroek until the lens was slightly more than half through. From this point the lens was removed by the use of the forceps alone. This having been done, the iris pillars were replaced, the conjunctival flap was adjusted, and the eye was closed in the usual manner.

It soon became evident that some types of cataract are not well suited to this method of extraction. In general these fall into the classes described by Knapp and Toeroek. Most of the successful attempts were made on sclerosed lenses. Many cataracts thought to be well adapted to this method were found to have friable capsules with rather tough zonulae, and the amount of manipulation necessary to express them in the capsule would have been much greater than that required to open the capsule and remove the soft part of the cortex remaining after the expression of the nucleus by stroking the cornea and irrigating the chamber. Frequently even soft white lenses with tough

capsules could not be removed by this method because of the difficulty in grasping the capsule. Also juvenile and traumatic cataracts were not easily removed in this manner.

In the past eleven months, 24 of 100 extractions were successfully done by combined expression and traction as described. The patients were all elderly persons, most of them over 60 years. The time of development of the cataract varied from six months to more than twelve years. In 9 of the 24 cases the bodies were large and sclerosed. Fifteen were soft, including immature and hypermature lenses and lenses with white fluffy looking cortices. Vitreous was lost in 3 cases, the loss being due each time to a squeeze by the patient before the capsule forceps was introduced. In every instance, however, the amount was very small. After the lens was grasped the vitreous receded and did not again appear in the wound. One patient squeezed violently as the forceps was applied, expelling the lens still in the grasp of the forceps but without loss of vitreous. Another had a deeply set eye with an extremely small palpebral opening (it would not admit the author's smallest speculum), atrophic conjunctiva, and obliteration of the fornices from old trachoma and pannus. This patient was an old woman who desired better light perception and insisted on having an operation despite an unfavorable prognosis. As the incision could not be made with a knife, it was started with a keratome and finished with the scissors. The lens was hypermature and delivered easily without loss of vitreous. The patient was discharged in five days with a well-healed wound. Six months later she could see to get about without glasses.

The forty-four extractions by combined expression and traction do not include several extractions in which the capsule was ruptured after the lens had engaged in the wound. This is due as often to pressure on the cornea as to a pull on the forceps, and occurs in both soft and hard cataracts. The collapsed capsule may be removed without difficulty and the chamber may be irrigated to remove any retained cortex with no more inconvenience than is experienced in the ordinary extracapsular extraction. One patient developed iritis with ciliary injection and pain on the third day. The complication yielded to atropin and moist heat, however, and disappeared by the tenth day. The average length of time the author's patients remained under observation after the operation was ten days.

Knapp, A.: Subretinal Exudate Simulating Sarcoma of the Choroid, with Anatomical Examination. *Arch. Ophthalm.*, 1919, xlviii, 559.

[The case reported was that of a man 71 years of age who stated at the time of examination that the sight in the right eye had been failing for four months, and that that of the left eye had been poor for several

years. Vision R. 1/200, L. 10/200. The general examination was negative. Ophthalmoscopic examination revealed a sharply defined circumscribed detachment of the retina in the macular region and a solid subretinal mass which was dull white in color except for a small amount of irregular mottling. A diagnosis of sarcoma of the choroid was made and the eye enucleated.

The detailed report of the pathologic findings is summarized as follows:

"The mass which was taken for a sarcoma of the choroid proved on histological examination to be composed of fibrous tissue presumably the result of either an organized exudate or of a blood clot. The choroid showed no inflammatory infiltration. Its vessels as well as those of the retina were normal."

Reference is made to similar cases reported by Hird, Coats, Leber, and Friedenwald. In some of these also the same error in diagnosis was made previous to operation.

J. S. CLARK.

White, L. E.: Retrobulbar Neuritis from Posterior Accessory Sinus Disease, with Report of Seventeen Cases. *Ann. Otol., Rhinol. & Laryngol.*, 1919, xxviii, 793.

After reviewing the literature, White reports 17 cases of retrobulbar neuritis, all but 2 of which were operated upon. In one of these cases the eye remained permanently blind and in the other the patient died from a sarcoma. Of the 15 cases in which operation was performed all but 1 were improved. In this case the eye had been practically blind for months, and the operation was undertaken to determine what effect, if any, the opening of the sphenoid would have on the dilated veins of the fundus. Normal vision was obtained in 7 cases; in 3 there was marked improvement though some atrophy; and in 4 there was only slight improvement. The failure in these last cases was due to the chronic nature of the disease and the delay in operating.

An early operation would have saved more of the vision. In 7 cases the toxæmia from the pus seemed the chief factor; in 8, hyperplasia was the predominating lesion; and in 2 pressure played the leading rôle. In 7 cases the nasal examination was negative while in 6 the X-ray findings were positive. Negative findings, however, by no means contra-indicated an operation. The middle turbinate was removed in all of the cases operated upon and the sphenoid opened in all but one. The posterior ethmoid cell was opened as a matter of routine, but unless infection was suspected the other ethmoid cells were not disturbed. The complete exenteration did not seem necessary in most cases. The Sluder technique of removing the middle turbinate and opening the sphenoid was followed. In practically all cases Wassermann and neurological examinations were made and the condition of the teeth investigated.

OTTO M. ROTT.

SURGERY OF THE NOSE, THROAT, AND MOUTH

NOSE

Ballenger, H. C.: A Study of 100 Cases of Suspected Chronic Nasal Accessory Sinus Disease with a Report of the X-Ray Findings. *Illinois M. J.*, 1919, xxxvi, 316.

As a result of his study the author draws the following conclusions:

1. The chief difficulties in deriving the full benefits of roentgenograms properly taken and developed are: (1) the reading of the plates, i.e., the determination of the presence or absence of abnormal shadows or outlines, and (2) the proper interpretation of the plates and the correlation of these findings with the clinical data.

2. The X-ray is a valuable supplement to clinical diagnosis, and when so considered, error in diagnosis is reduced to a minimum.

3. Valuable surgical information can be gained as to the presence or absence, the size, shape, depth, etc. of the sinuses.

4. Thickening of the mucous membrane of the sinuses due to operations, infections, irritations, etc. will produce a cloudy appearance or an indistinct outline of the sinus in the plate.

5. As a guide to the postoperative progress the X-ray is of little assistance in cases of chronically diseased sinuses.

6. The X-ray is usually essential to determine whether the condition involves several sinuses or is confined to a single sinus or part of a sinus.

O. M. ROTT.

THROAT

Patterson, N.: Diathermy. *Lancet*, 1919, cxcvii, 1020.

The author gives a general discussion of diathermy as used in malignancy since its introduction in 1910. In describing the instruments and technique he states that the purpose is to use a high frequency current which reverses its direction about 1,000,000 times per second. One electrode is placed over the chest or abdomen, and between it and the skin are interposed layers of lint saturated with normal saline. The electrode used for destruction of the tissues may be of any shape. Its handle is insulated and the operator wears rubber gloves. The resistance offered to the passage of current produces heat which coagulates the albumin in the tissue. The electrode is applied before the current is turned on, and the current is switched off before the electrode is removed. The current is gradually increased until bubbles appear in the tissue when the electrode is changed to a different area.

In tumors of the buccal cavity and oropharynx especially diathermy is indicated because excision

is usually impossible or hazardous. In tumors of the base of the tongue, epiglottis, and larynx, suspension is desirable for exposure. Occasionally surgical means are necessary to obtain good exposure. The following are given as advantages of diathermy over cutting methods.

1. Bloodlessness. Occasionally, however, a delayed hæmorrhage from the slough results.

2. Total destruction of the tissues in the neighborhood of the terminal and the impossibility of cell implantation.

3. Sterilization of the parts. All organisms are killed by the heat.

4. Strictures some distance from the electrode are destroyed.

5. Near-by vascular structures are sealed up so that absorption of bacteria and toxins is less apt to occur.

6. Shock is generally much less than after a cutting operation.

7. The ease with which diathermy can be applied in cases of recurrence.

8. The scar is denser and spreads further into the surrounding tissues.

9. Exposure is less difficult.

10. The field is bloodless and therefore the tumor can be better defined.

11. Age is not a contra-indication.

12. The growth is approached practically always from the mucous membrane surface.

The tumor should be defined and all tissue $\frac{3}{4}$ in. beyond its borders should be destroyed. When possible, complete excision with the use of the diathermy electrode is perhaps the best. A sharp electrode may be used in relatively bloodless areas. When time is an element the author occasionally dissects the tumor with a knife and then uses the electrode over the entire raw surface. Ether should be avoided as an anæsthetic as there is danger of igniting the vapor.

The author uses the suspension apparatus in every case of doubtful exposure. Dental sepsis, while not a factor in diathermy, should be attended to. In cases in which the larynx is involved a preliminary laryngotomy or tracheotomy should be performed. Because of the possibility of delayed hæmorrhage the author frequently ligates the blood supply to the area involved before using diathermy. The cervical glands, when involved, should always be removed when operable.

The after-treatment of diathermy consists chiefly of measures for cleanliness and a liberal diet. Hæmorrhage is taken care of in the same way as in cutting operations. As soon as the slough is removed the patient is encouraged to sit in a wheel chair.

H. R. LYONS.

Dabney, V.: Delayed Secondary Hæmorrhage Complicating Tonsillectomy. *Ann. Otol., Rhinol., & Laryngol.*, 1919, xxviii, 697.

Secondary hæmorrhage is rare, especially ten days after operation. The author presents four cases in which bleeding occurred more than twenty-four hours after operation for the removal of the faucial tonsils. The first two operations were performed under local anæsthesia without adrenalin, and the others, under ether and with the cold snare.

The first case was that of a girl 18 years of age. The hæmorrhage occurred on the second day and was checked by holding ice firmly in the fossæ.

In the second case there was very free bleeding during the operation and secondary hæmorrhage six hours afterward. Ten days later bleeding occurred again while the patient was walking on the street.

In the third case the tonsillectomy had been performed by another surgeon one week previously and there had been much difficulty in arresting the flow of blood at the time of operation. During the five days the patient remained at the hospital there was no further hæmorrhage. Two days later, however, he was awakened by a sensation of strangulation and found his mouth full of blood. As it was impossible to check the flow for more than a few minutes at a time, he was again taken to the hospital. There, under general anæsthesia, a jagged tear in the middle third of the posterior pillar was discovered and clamped.

The fourth tonsillectomy, done under ether and with the cold snare, was the second operation performed on the tonsils and was unusually difficult. Bleeding with the formation of a clot in the fossa occurred six days after operation. The hæmorrhage was stopped by packing with soft gauze sponge which was allowed to remain for twenty-four hours. A few minutes after the removal of the packing,

however, the bleeding recurred and packing was again necessary.

The cause of these secondary hæmorrhages cannot be stated definitely, but in the author's opinion a possible explanation lies in the fact that a slough, involving the vessels may have become separated during the operation.

MOUTH

Nodine, A. M.: Impacted Lower Third Molars. *N. York M. J.*, 1919, cx, 762.

The predisposing causes of impaction of lower third molars are: (1) defective embryonic development; (2) perverted development; (3) malnutrition; (4) syphilis; (5) rachitis; (6) neurotic tendency; (7) eruptive fevers; (8) anæmia; (9) artificial feeding; (10) scurvy; (11) cretinism; and (12) idiocy. The exciting causes are: (1) arrested maxillary development; (2) undue thickening and resistance of the overlying tissue; (3) undue stimulation of the inferior dental nerve by pathologic conditions producing nutritional changes that intensify the bone in the region of the impacted tooth; (4) malposition due to contacted dental arches; (5) severe traumatism to the jaws causing deposition of lime salts in the cancelous tissue; (6) too early loss or extraction of deciduous teeth producing abnormal density of the cancelous tissue of the mandible; (7) improper orthodontic treatment; (8) improper or excessive pressure in orthodontic cases; (9) inflammations of the jaw bones caused by decayed teeth; and (10) a local increase in the density of the bone brought about by inflammation of the periodontal membrane extending into the alveolar process.

The general effects of impacted teeth are functional, nervous, and mental disorders, paralysis of the arm, tonic spasm of the upper extremities, nervousness, insomnia, epilepsy, etc.

M. N. FEDERSPIEL.

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SURGERY OF THE EYE AND EAR

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SURGERY OF THE NOSE, THROAT, AND MOUTH

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INTERNATIONAL ABSTRACT OF SURGERY

MAY, 1920

ABSTRACTS OF CURRENT LITERATURE GENERAL SURGERY—SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE

Gillies, H. D.: *The Tubed Pedicle in Plastic Surgery*. *N. York M. J.*, 1920, cxi, 1.

The method described by the author was evolved by him in October, 1918, when he was confronted with the difficulties of restoration in cases of severe facial burns. In these cases all of the skin had been damaged or destroyed and no facial flaps were available from which to make the necessary repairs. It was therefore necessary to obtain skin from the chest and neck, but for such flaps it was difficult to obtain an adequate blood supply. This problem was solved to a very great extent by the method which forms the subject of this article.

If a large area of the skin of the chest is to be grafted to the face it is necessary to have a pedicle to the flap of skin the base of which is situated somewhere in the upper part of the neck. A strip of skin, usually between $2\frac{1}{4}$ and 3 in. wide, is raised from the neck to form the pedicle, its upper and lower extremities being left untouched. Two edges of the pedicle are then accurately sutured together, skin edge to skin edge, by a continuous suture. Subcuticular catgut is perhaps the most effective suture material but in the majority of cases ordinary horse-hair is employed.

It is usually possible to approximate the edges of the wound made by the removal of the flap by undermining its edges and suturing them underneath the raised pedicle. This is facilitated if the patient raises his shoulder and inclines his head toward the affected side. In addition to the skin-edge sutures, tension sutures are necessary. The pedicle, now tubed, lies like a sausage between the base and the extremity.

In the course of about three weeks considerable arterial and venous anastomosis has occurred in the pedicle and the blood is led from the base of the pedicle toward the extremity of the chest. The flap is now ready to be raised from the chest and sewed into position on the face, the pedicle being left in its

tube form. It is obvious that in this manœuvre the pedicle cannot become infected. Moreover it will stand a considerable amount of twisting and even kinking. By means of the pedicle the blood supply of the flap is greatly improved.

When the flap has taken root on the face the pedicle may be divided and returned to the neck or, as is more commonly done, divided at the neck end, opened out, and spread upon some other portion of the face. When once the flap is placed upon the face, it is possible to use the pedicle in a variety of ways.

In the manner described, flaps of skin may be brought to the face by stages from long distances. In other parts of the body larger flaps of skin may be used to relieve the disability caused by severe burns and contractions. The article is illustrated with photographs showing the application of the method.

E. C. ROBITSHEK.

Horsley, J. S.: *Surgical Drainage from a Biological Point of View*. *J. Am. M. Ass.*, 1920, lxxiv, 159.

Horsley calls attention to the defenses of the body against injurious foreign substances, mentioning as examples the vomiting of nauseating food by the stomach, the expulsion of irritating substances from the bladder, the rectum, or the larynx by muscular action, and the attempted washing away of irritating foreign bodies in the nose or eyes by increased secretion. In solid tissue the body makes an effort to extrude irritating foreign substances by reversing the lymph circulation and pouring out lymph around them. This phenomenon is the biological basis of drainage. Abdominal drainage is practically always uphill but is successful because the drainage material not only relieves the pressure but provokes the out-pouring of large quantities of lymph to extrude it and with this serum are carried along the products of bacterial infection that otherwise might be absorbed.

In solid soft tissue, as in the thigh, the lymph supply is not as abundant as in the abdomen and

consequently gravity drainage must be utilized. In the abdomen the supply of lymph is so great and its out-pouring along the drainage track so constant that it makes little difference whether the drainage tube is pointed up or down as long as it is of sufficient size and of the proper material to provoke the out-pouring of serum.

Drainage should be instituted after every radical operation for cancer of the breast or of the neck as it tends to prevent the absorption of cancer cells that may be left in the wound.

Irritating foreign substances in bone cause the absorption of lime salts around them. Nature evidently does this to loosen the foreign substance in a preliminary effort to extrude it. Such induced osteoporosis accounts for the frequent cases of non-union of fractures after the use of metal plates and screws. Probably many so-called apical abscesses in the teeth are the result of the reaction of the bone to the material with which the root of the tooth has been filled.

In infected epithelial-lined hollow viscera drainage carries off the inflammatory products, affords physiological rest, and produces a reversal of the circulation of the local lymphatics which tends to prevent the absorption of the septic products. It is probably for these reasons that drainage of an infected bladder or of the common bile-duct in pancreatitis is effective.

The drainage material selected should induce a reversed flow of lymph, carry away the liquid products of the wound, and cause the least injury to the wound. The ideal drainage material has not been found, but combinations of gauze and rubber tissue have proved fairly satisfactory.

Wood, J. C.: Uncorrected Factors Perpetuating Stomach Symptoms after Surgical Work. *N. York M. J.*, 1920, cxi, 136.

The author first calls attention to the fact that, notwithstanding the strides made in roentgenology, physiology, and chemistry, there are many organic and constitutional conditions remote from, or in close proximity to, the stomach which may give rise to symptoms simulating organic disease. Therefore the only safe diagnosis when surgery of the stomach is contemplated is a diagnosis by exclusion. Among the confusing factors which may perpetuate indigestion are mentioned the various forms of toxæmia, cerebral and hysterical conditions, asthenopia and other refractive errors, crises having their origin in the kidneys, gall-bladder, or pancreas, and oxaluria.

The chief objects of the discussion, however, are: (1) to emphasize the importance of chronic lesions of the appendix as disturbing factors which frequently cause indigestion and hyperacidity with gastralgia and even hæmatemesis; and (2) to re-emphasize the fact too often overlooked that displacements and diseases of the female pelvic organs are frequently responsible for indigestion and malnutrition. The author states that in observing

the trend of the times he sometimes wonders whether the general surgeon has not forgotten that within the medulla is a reflex center which presides over the stomach and abdominal viscera and that this center is in constant communication with the pelvic organs through the uterine and ovarian plexus, affecting them for good or evil.

A composite picture of patients coming to the gynecologist for surgical relief is given as follows:

The patient, aged 30, is a multipara. Her metabolism is profoundly disturbed as manifested by loss of flesh, flabby muscles, dermatoses, and cold hands and feet. The hæmoglobin is low, possibly 70; the red blood count is 4,000,000 or less; the leucocyte count low, with an increase in the lymphocytes; and the blood pressure usually below normal. The patient has headaches, mental depression or actual melancholia, and constipation or alternate constipation and diarrhœa with mucous enterocolitis.

In the majority of instances the appendicular symptoms referred to are present. Often there is a general enteroptosis, and the kidneys, especially the right kidney, are usually palpable because of the emaciation. In many cases the thyroid is more or less enlarged and there is an increased calcium output in the urine. In cases of hypofunction of the thyroid, the calcium output is diminished. There is often indicanuria and not infrequently oxaluria. The general symptoms of incipient Basedow's disease are not uncommon. Menstruation is painful and scant or excessive. Dyspareunia and impotency are common symptoms. Finally, there is marked indigestion characterized by hunger pains, flatulency, heartburn, satiety, a heavily coated tongue, and fæcal breath.

A physical examination of the abdominal and pelvic organs reveals an enlarged, subinvolved, and sharply retroflexed uterus with the ovaries under the fundus. When the ovaries and tubes are more seriously involved, the general stigmata of gonorrhœa will be in evidence. The cervix is torn and the pelvic floor relaxed. There is an eversion of the cervical lips with inflammation of both the cervical and fundal mucosa, giving rise to leucorrhœa and menorrhagia. The sphincter ani is tight, an important factor in perpetuating the constipation, as emphasized by Hilton.

A patient thus afflicted has indigestion: (1) because the reflex center in the medulla is constantly receiving morbid stimuli from the diseased and displaced pelvic viscera and from this center these stimuli are transmitted to the stomach; and (2) because sooner or later her metabolism is so disturbed that she becomes a victim of autointoxication the products of which further react upon the cerebral center to which they are carried through the blood stream. The hyperthyrea, if present, only adds to the nervous and digestive symptoms already induced. A vicious circle is thus established which may in time end in organic disease of the stomach or perpetuate a long-standing indigestion even though the lesions are surgically removed.

On the other hand, remedial measures that comprehend the correction of all the pelvic lesions as well as those of the appendix will often clear up the trouble in the upper abdomen and make later work in that region unnecessary. If desired, an exploration of the upper abdomen may be made through the lower incision. This procedure does not of course apply to gastric conditions in which danger portends or there is marked deformity or displacement.

Stomach surgery when well defined and clearly indicated is too firmly established to be affected by adverse criticism. In all instances in which the gastric condition is chronic, however, the entire body should be thoroughly examined before an operation is performed on the stomach.

The subject in hand has nothing to do with surgery for diseases of the thyroid except insofar as thyroid pathology enters into the syndrome which is given as typical of a large class of cases of indigestion due to causes remote from the stomach. The author has seen many enlarged thyroids with the accompanying manifestations of Graves' disease disappear after the patient's disturbed metabolism had been corrected by the work outlined. Therefore the fact becomes apparent that the thyroid is often needlessly sacrificed by indiscriminating surgeons.

ASEPTIC AND ANTISEPTIC SURGERY

Gardner, C. B.: *The Treatment of Infected Wounds, with Demonstration of the Carrel-Dakin Technique.* *J. Michigan State M. Soc.*, 1920, xviii, 1.

The Carrel-Dakin treatment for infected wounds is discussed under four heads, i. e., (1) mechanical cleansing, (2) chemical sterilization, (3) bacteriological control, and (4) closure.

The surgical procedure of excision has for its purpose not only the mechanical cleansing of the wound but also its preparation for the distributing tubes. This preparation depends also on the length of time that has elapsed since the injury was received. If the patient is seen in the so-called pre-inflammatory period, it should be most thorough. Free incisions are called for as they can be brought together again in a few days and extensive opening up of soft parts nearly always yields earlier closing. In the preparation of the skin the use of iodine predisposes to subsequent irritation from the hypochlorite solution. Vigorous mechanical cleansing with neutral sodium oleate and sterile water with alcohol or ether will suffice, but care must be taken to avoid injuring the tissues further by too brisk use of the gauze.

At this time also all foreign bodies and damaged tissue should be removed by means of a sharp cutting instrument such as a razor. The incisions must be sufficiently long to permit careful inspection of the seat of fracture and the surgeon should be conservative in the removal of bone and periosteum. Splin-

ters lying free should be removed but those with adherent periosteum should be allowed to remain. In longitudinal fractures the exposed marrow should be removed. The instillation tubes should be placed in as close contact with the bone at the seat of the fracture as possible. Openings at dependent points for drainage are contra-indicated as the chemical used for sterilization should come in contact with all parts of the wound. One exception to this is empyema.

The incidence of the inflammatory period after an injury is variable, but infection is usually well established in from twenty-four to thirty-six hours. At this time great care must be used in the surgical procedure in the wound and as a rule active manipulation is to be condemned. The use of the scalpel in a wound from which serum is exuding is exceedingly dangerous. Usually, however, it is possible to insert the instillation tubes with little manipulation. The main exception is when there is muscle involvement. In such cases it is necessary to open up the focus of infection as well as to remove hæmatomata that may be easily reached. The limb should be kept rigidly immobilized not only to reduce the pain but to prevent dissemination of bacteria by muscular action. After the infection has been reduced by chemical instillation the more radical surgical procedures may be carried out.

A fact to be borne in mind is that wounds should not be sutured when the incision has gone through old cicatricial tissue as in such tissue bacteria may remain latent for some time. A study of a number of war wounds resulting in osteomyelitis warrants the following conclusions:

1. Successful suture is generally impossible in operations made in or through wounds which have undergone prolonged suppuration.

2. In bone grafting for non-union success is to be expected only if the two-stage operation is performed.

3. The operation of sequestrectomy for bone which in the X-ray picture appears rarified should not be insisted upon in the absence of suppuration.

In injuries to large blood vessels, ligatures must be placed both above and below the injured area. Chromic catgut or linen must be used instead of silk or plain catgut as the latter are quickly dissolved by Dakin's solution. All surgical procedures must be carried out under strict asepsis and all dressing materials handled with dressing forceps. Alcohol and ether should not be used on the wound surface, though ether may be employed to clean the surrounding skin after cleansing with neutral soap and water. The wound surface itself must be cleaned with neutral sodium oleate and sterile water.

A wound which is being treated successfully has no odor. The number and arrangement of the tubes should be such as will insure an abundant and fresh supply of the hypochlorite at each two-hour instillation period. Gauze should not intervene between the tubes and the tissues to be treated.

Covered tubes should not be used in the presence of much wound secretion. The tubes may be held in place by means of gauze sponges soaked in the hypochlorite solution and should be tested out regularly to determine their patency. To protect the surrounding skin, gauze impregnated with a mixture consisting of vaseline, 91 per cent, paraffin, 6 per cent, and resin, 3 per cent may be placed around the wound. The mixture is melted and poured over the strips in a tin box which is then placed in the autoclave at 15 lbs. pressure for forty-five minutes. The wound may be supplied with the antiseptic intermittently, continuously, or by the syringe method. Automatic systems have been tried but have not been very successful.

The guide to the true condition of the wound is the bacterial flora of the secretions. This is studied by either the smear or the culture method. Instillation should be discontinued at least two hours before the examination is made. From five to thirty fields should be counted under the microscope and the average number of bacteria determined, the result being charted. Counts should be made at least every forty-eight hours. Bacteriological examinations of fresh wounds are unsatisfactory as the bacteria are not disseminated and blood is present. Depending upon the size and condition of the wound, from three to ten days are required to effect sterilization. Failure in this calls for a careful investigation as to the technique of instillation, the continued presence of foci of infection, and the advisability of an exploration.

Wounds of soft parts which have shown a satisfactory bacteriological count may be closed in five or six days providing there are no local or general contra-indications and treatment was inaugurated shortly after the receipt of the injury. When the time which elapsed between the manifestation of infection and the beginning of treatment was longer, from eight to twelve days should pass before the wound is closed and it should have been sterile for four or five days. In compound fractures which have once been the seat of active inflammation a still longer time is required, usually a month.

If the skin is freely movable and cicatrization has not begun, the wound edges may be brought together with adhesive strips. Secondary suturing requires a general anæsthetic. Adherent skin must be freed and the skin margins freshened. Good apposition may be obtained by dissection of the flaps. A few strands of silkworm gut may be inserted for drainage, especially if at the time of closing the bacteriological count is 5 or 6 per field. Closure is never done, however, unless the streptococcus and the gas bacillus have been proved absent.

The silkworm gut should be removed in forty-eight hours and the secretions obtained with it examined bacteriologically. If there are indications of impending infection the wound should be opened up again and subjected to re-sterilization. In wounds which have undergone prolonged suppuration the tissues should be dissected and suturing

delayed until sterilization has been continued for a few days longer. It is never safe to put sutures through cicatricial tissue unless the sterilization is continued.

The author gives a description of the apparatus to be used and information regarding the preparation of the hypochlorite solution, tests for alkalinity, titration, etc.

I. W. BACH.

ANÆSTHESIA

Silk, J. F. W.: The Administration of Anæsthetics in Home Military Hospitals. *Am. J. Surg.*, 1920, xxxiv, Anæst. Supp., 2.

In the pre-war days the author deprecated the endeavor to use any one anæsthetic and insisted upon the advantages of varying the procedure in accordance with certain elemental circumstances such as the patient's sex, age, and physical condition and the nature of the operation. While his views on this point have remained unchanged, he now appreciates the fact that the relative values of the factors mentioned have altered materially under the stress of war. The patient's age and sex have lost their importance, and the main determining factors are those of his previous condition and the nature of the operation.

Except for the secondary results of his injury, the soldier may be regarded as an average healthy male. The secondary results, however, are of much importance and introduce factors which, comparatively speaking, are unknown in civilian practice. In many cases there has been somewhat prolonged suppuration of varying intensity. This may not produce all or any of the characteristic objective symptoms of acute sepsis, but it has a very bad effect upon the heart muscle. It is rather more than a mere coincidence that of 40 postmortems performed in home military hospitals the heart muscle was found more or less degenerated in 26 and in these 26 cases there were definite records of prolonged sepsis in 20.

The dilated heart of over-training and under-feeding is fairly common and when by a rare chance a patient with a heart so affected is anæsthetized there is apt to be trouble. There are at least three classes of cases in which the work of the anæsthetist has been most distinctly altered and severely tried, i. e., operations for spinal injuries, orthopedic surgery in general, and plastic operations upon the face.

For routine anæsthesia it is necessary to select an anæsthetic which is least apt to cause injury, and in the use of which the anæsthetist, even if rather below the average in skill, is least apt to go wrong. The routine use of pure, unadulterated chloroform as a first choice is to be avoided as much as possible. In the hands of the most skilled the mortality is relatively high, approaching 1 death in 2,000 cases. Of the deaths under anæsthesia which have been reported to Silk since January, 1917, at least 55 per cent, and probably more, were due to or

occurred under chloroform used in undiluted form. In many other cases chloroform was by far the chief drug administered. In fully 28 per cent the death occurred before the operation was begun.

While, as stated, the author objects to the use of undiluted chloroform as a first choice for routine work, his condemnation does not extend further than this. He recognizes the value of the drug for many cases and believes that when it is sufficiently diluted with ether and administered carefully by the open method it is a very simple and admirable agent to induce anaesthesia previous to the continuous use of ether. For short operations local anaesthetics or nitrous oxide are recommended. If these are not available, the anaesthetic of choice for continuous work is ether given by the open method.

Less pure chloroform and more ether is being used in the English hospitals now than twelve months ago and definitely good results have followed the change for the death rate for the quarter ending September 30 was rather less than one half the average rate for the two quarters preceding. In modified or chronic shock Silk gives morphine, but in cases of sepsis, malaria, and heart trouble he avoids its use. In cases of intracranial conditions morphine is usually unnecessary as the patient is often semi-comatose or dazed. For this reason, also, very little anaesthetic is required.

The induction of anaesthesia should be based upon the following three fundamental principles:

1. Avoid all but the most dilute doses of chloroform.
2. Give as little anaesthetic of any sort as possible.
3. Avoid any condition resembling asphyxia by diluting the vapor very freely. For this purpose oxygen given either by itself or bubbled through the anaesthetic is very useful.

ISABELLA HERB.

MacNider, W. de B.: A Study of the Toxic Effect of General Anaesthetics in Naturally Nephropathic Animals; and the Prevention of the Toxic Action. *Am. J. Surg.*, 1920, xxxiv, Anæs. Supp., 15.

MacNider studied the effect of the susceptibility of the kidney to certain injurious agents, such as anaesthetics, not only from the point of view of pathology, but from the standpoint of renal function. A group of naturally nephropathic dogs were anaesthetized either by morphine-ether or by Grehan's anaesthetic, the active anaesthetic constituent of which is chloroform. Each animal so anaesthetized was controlled by a normal animal which had been subjected to the same examination.

The anaesthesia for the control and nephropathic animals lasted one and a half hours, and at each half-hour interval the urine was collected and measured and the blood was examined for its reserve alkali content. At such half-hour intervals, different diuretic substances were given the animals, and their effect on the functional response of the kidney was noted in the output of urine during the following half-hour period. The diuretic solutions em-

ployed were: (1) theobromine, 1 per cent; (2) caffeine, 1 per cent; (3) a 0.9 per cent solution of urea; (4) a 20 per cent solution of glucose; and (5) pituitrin, 0.5 c. c. per animal.

The difference in response of the normal control animal as compared with a naturally nephropathic animal during the course of the anaesthesia was very striking. All of the control animals were freely diuretic after the establishment of a satisfactory state of surgical anaesthesia. The output of the urine varied from 2 to 8 drops per minute. The reserve alkali of these animals and the tension of alveolar air carbon dioxide was normal at this period of anaesthesia and remained normal for the hour and a half of the experiment.

When the control animals were given any of the diuretic solutions an increase in the formation of urine occurred. The output was greatest when glucose and pituitrin were administered.

When a similar degree of surgical anaesthesia had been produced in the naturally nephropathic animals, the output of urine was sharply reduced. Only one of the twelve animals was forming urine at this early stage of the experiment, and its output was only 2 drops per minute. The rest of this group had become anuric. During the course of the experiment, the reserve alkali of the blood showed a progressive reduction in all of the animals, so that by the end of the hour and a half the readings varied between 7.8 and 7.45. During this period, the same diuretic solutions were given these animals as were administered to the control animals. The animal which at the beginning of the experiment was forming 2 drops of urine per minute responded half an hour after the administration of theobromine with an increase of urine to 10 drops. All of the others remained unresponsive to the various diuretic solutions. The state of anuria which was established by the time these animals had become completely anaesthetized persisted throughout the experiment and was uninfluenced by diuretic solutions which in the normal control animals were of distinct diuretic value.

These observations warrant the following deductions: The use of an anaesthetic in naturally nephropathic animals leads to a progressive reduction in the reserve alkali of the blood and, associated with this change in the acid-base equilibrium, a rapid reduction in the formation of urine or the establishment of a state of anuria which is uninfluenced by various diuretic solutions.

By the intravenous injection of an alkaline solution an attempt was made to protect the kidney of naturally nephropathic animals against the toxic effect of an anaesthetic. An hour before anaesthesia the control animals were given 25 c. c. of a 0.9 per cent solution of sodium chloride per kilogram while the naturally nephropathic animals, which were not to serve as controls, were given a similar amount of sodium carbonate solution which was equimolecular with a 0.9 per cent of sodium chloride. The animals were then anaesthetized as described previously.

The naturally nephropathic animals which served as controls and which received intravenous injections of the sodium chloride solution became anuric by the time a state of satisfactory surgical anaesthesia had been produced. The reserve alkali of the blood showed a reduction which varied between 7.9 and 7.8, and during the course of the anaesthesia there was a further progressive reduction so that at the termination of the experiment the reserve varied between 7.7 and 7.6. All of these animals remained anuric during the course of the experiment and were not responsive to diuretic solutions of theobromine, urea, glucose, or pituitrin.

The naturally nephropathic animals which received the sodium carbonate protection were all diuretic at the completion of the anaesthesia and their reserve alkali varied between 8.25 to 8.15. During the course of the anaesthesia these protected animals showed the effect of the anaesthetic also by a reduction in their alkali reserve and at the termination of the experiment the values varied between 8 and 7.85. The animals of the group which showed the least reduction in the alkali reserve, a reduction not under 7.9, remained diuretic during the course of the experiment and were responsive to diuretic solutions which were of no value in the control animals. The author concludes:

1. That the use of an anaesthetic effects a reduction in the alkali reserve of the blood which is very marked in naturally nephropathic animals.
2. That such a reduction is associated with a decrease in the kidney function.
3. That if the alkali reserve of the blood during an anaesthesia can be kept above 7.9, the animals remain not only diuretic but also responsive to the various diuretic solutions.

ISABELLA HERB.

Taddei, D.: General Ether Anaesthesia in Short Operations; Analgesia by Psychic Block
(L'anestesia generale eterea nelle operazioni di breve durata—analgesia per blocco psichico). *Riforma med.*, 1919, xxxv, 896.

It has been known for a long time that there is an incipient analgesic condition in every inhalation narcosis. This analgesia is obtained after ten or twenty inhalations and has often been utilized by surgeons and obstetricians. In a short operation the surgeon watches for the moment when the patient's psychic condition reaches the desired point and when it arrives he proceeds with the manoeuvre desired.

The author's technique in obtaining the analgesic stage differs from that of others. He uses a common mask which covers the face well. No previous preparation of the patient is necessary. The method is applicable only to very short operations or to short treatments. The patient lies horizontally on the operating table, the limbs being fixed unless the operation is to be performed on a leg or an arm, in which case they are maintained in the desired position by an assistant. When all is ready the

mask is put in place and the ether is poured upon it in such a way that air cannot be breathed simultaneously. The operation is begun immediately and as soon as the painful part is completed the mask is removed. Usually when the mask is applied the patient gasps and tries to shake it off but this is prevented by the anesthetist.

There is some slight cyanosis. The analgesic condition lasts for from thirty to sixty seconds, a period of time which is usually sufficient in the cases for which the method is used. After the mask is removed the patient remains quiet for some minutes, breathing calmly and regularly. Complete return of consciousness is preceded by a period of semi-consciousness during which he is able to obey the surgeon's orders. After from five to ten minutes he is again on his feet. Only the suffocation is remembered. The pain from the wound is not experienced until later.

The analgesia may be prolonged for from two to five minutes by the administration of additional small doses of ether, but in such cases vomiting usually occurs after the removal of the mask, especially if the patient has not been prepared previously.

Even in cases of infection the method may be repeated on successive days or, better, on alternate days when painful medication or manipulation is necessary.

The author prefers to designate this very short anaesthesia as "psychic block" as he believes it is not due to the chemical action of the ether on the nerve centers but is analogous to the well-known analgesia observed in great emotion. He has employed it in about 3,000 cases (the majority those of soldiers) without pulmonary, cardiac, or similar affections. A fact commonly observed is that on the day of the anaesthesia there is anorexia for solid food.

W. A. BRENNAN.

Shipway, F. E.: Intratracheal Insufflation of Ether in Operations Which Involve Bleeding into the Air Passages. *Proc. Roy. Soc. Med.*, Lond., 1919, xiii, Sect. Anæ., 1.

Shipway states that as it is now about ten years since Elsberg first used intratracheal insufflation, sufficient time has elapsed to justify the claim that the value of the method has been established. While it has had to meet with much opposition from those who resisted its advance either because of excessive caution or because of a mistaken conception of its difficulties, its use during the war has brought it into prominence.

The author's experience with intratracheal insufflation is based on 930 cases. In 407 of these it was used for operations on the face, mouth, and pharynx in which there was bleeding into the air passages.

When difficulty is experienced in exposing the vocal cords the application of a 5 per cent solution of cocaine to the pharynx and epiglottis is recommended. This is particularly helpful when light

anæsthesia is indicated and refutes the criticism that the depth of anæsthesia necessary to pass the catheter prohibits the application of the method in cases of this kind in which its use is especially advantageous.

The author discusses at some length the abnormal conditions following gunshot wounds of the face and jaws, loss of tissue and subsequent scarring, contraction, and deformity, which during the war complicated intubation. After several ineffectual attempts to pass the catheter in the head-down position used by laryngologists the patient was raised to the semi-recumbent posture and the head somewhat flexed. The difficulty then disappeared. The most serious obstacle was presented by a scarred and adherent tongue but in this case intubation was rendered successful by a careful examination of the altered anatomy beforehand

and attention to the patient's position and the illumination.

In cases of cancer of the mouth the question arises as to whether the administration of the anæsthetic through a laryngotomy or tracheotomy tube is a better method than intratracheal ether. It has been said that cancer cells may be implanted further down the air passages by the introduction of the direct laryngoscope. It is difficult to prove this assertion but the danger should not be overlooked; it would seem that if contact with the growth cannot be avoided, the advisability of opening the trachea should be given serious consideration.

Factors which must be taken into account before a preliminary narcotic is given are the patient's age and condition, the nature of the operation, and the probable duration of the anæsthesia.

ISABELLA HERR.

SURGERY OF THE HEAD AND NECK

HEAD

Jefferson, G.: *The Physiological Pathology of Gunshot Wounds of the Head.* *Brit. J. Surg.*, 1919, vii, 262.

The author's report is based on a series of cases seen at General Hospital No. 14 of the British Expeditionary Forces from July to October, 1918. It includes 220 cases, 170 of which were operated on in that hospital.

The cause of death was usually bulbar anæmia caused by anatomical injury, infection, or both. The results were influenced by the patient's condition on admission, the time between the injury and the operation, and the length of postoperative quiet. These patients did not stand transportation well.

The wounds were classified into three groups: (1) simple scalp wounds; (2) scalp wounds in which the calvarium was fractured but the dura was not penetrated, and (3) fractures in which the dura was penetrated.

In Group 1 there were 54 cases with no deaths. Some of the patients, however, suffered brain injury, 17 showing localizing signs of concussion or contusion.

In Group 2 there were 37 cases with no deaths. The dura was usually injured, but as a rule the damage was slight. In 4 cases there was injury to the meningeal vessels, and in 80 per cent cerebral contusion.

Group 3, including all cases in which the dura was penetrated, numbered 79 cases. There were 29 deaths, a mortality of 36.7 per cent.

Because of their anatomical position the ventricles were easily and frequently involved. Such involvement was a serious complication as the infectious material was rapidly carried through the foramina of Key and Retzius to the base of the brain. The organism most frequently found in

cultures was the bacillus welchii. The bacillus sporogenes was next in frequency. The streptococcus was rarely present, but extremely virulent as it was found in 33.3 per cent of the fatal cases.

In-driven bone fragments were a great source of infection, and sequestra tended to delay healing. Cerebral hernia and cerebral fungi occurred in 50 per cent of the cases after both large and small defects and in all regions of the skull. They were considered an evidence of sepsis and were due to local swelling and increased intracranial pressure. As a rule, leakage of spinal fluid through a fungus meant extension of the infection to a ventricle. In 11 cases in which it occurred there were only 3 recoveries. The treatment used and recommended for cerebral fungi was lumbar puncture.

In the operative technique great care was taken to make the toilet as thorough as possible. Intact dura was not incised since incision was thought to increase the danger of infecting the brain. Local anæsthesia was used whenever practical.

The neurological aspects of the cases were closely followed. Three phases were observed: (1) signs and symptoms of disturbed cerebral circulation; (2) localized signs and symptoms of the special cortical areas; and (3) the meningeal syndrome which was often present even when the cerebrospinal fluid was sterile. Two cases seemed to present the picture of rigidity of the lower limbs described by Holmes and Sargent as "superior longitudinal sinus syndrome." In both there was definite injury of the cortex.

The three chief causes of death were hæmorrhage, traumatic œdema, and sepsis. There were no deaths from intercurrent disease. The average time before death was seventeen days. Four patients died as a result of the injury, 2 of them within forty-eight hours; 3 died of cerebral abscess; 2, of massive gas infection; and 19, of meningitis. J. I. MITCHELL.

Policard, A., and Murard, J.: A Histologic Study of a Cartilaginous Cranioplastic Graft Thirty Months Old (*Étude histologique d'une pièce de cranioplastie cartilagineuse datant de trente mois*). *Lyon chirurg.*, 1919, xvi, 378.

From an analysis of the literature it is evident that as a rule cartilage grafts become atrophied. While in some instances the cartilage preserves its normal aspect, in others it is more or less completely resorbed and its place is taken by a mass of fibro-connective tissue.

The graft studied by the authors was implanted in the skull of a soldier following trephination. The patient died from epilepsy thirty months later.

It was found that this graft was united to the cranium wall by a purely fibrous formation. At no point was there any direct union. The fixation was sufficiently solid, however, to occlude the opening in the skull.

Sebileau, who examined 5 cartilaginous grafts in cases of pseudarthrosis of the lower jaw, stated that despite the apparent continuity of the maxillary axis there was no physiological consolidation.

Resorption of cartilage grafts is extremely slow, a fact which is of great importance. When the grafts are inserted subcutaneously in rhinoplastic operations, however, they seem to be resorbed much more rapidly than when they are implanted in the cranium.

The perichondrium is of considerable importance in maintaining the nutrition and vitality of cartilage grafts. It is a perfect agent of fixation between the graft and the surrounding connective tissue and acts as a buffer against the invasion of the cartilage by the connective tissue. In the joints where there is no perichondrium and the cartilage rests directly upon the tissues resorption and dissolution proceed much more rapidly. Therefore whenever possible the perichondrium about a graft should be carefully preserved.

W. A. BRENNAN.

Bellin, Aloin, and Vernet: Tuberculous Osteitis of the Temporal Region and of the Accessory Cavities of the Ear (*Ostéite tuberculeuse du temporal et des cavités annexes de l'oreille*). *J. de chir.*, 1919, xv, 486.

The authors describe five clinical types of tuberculous osteitis of the region of the temporal bone and the accessory cavities of the ear: (1) the progressively infiltrating type; latent tuberculous mastoiditis; (2) the type causing necrosis with the formation of sequestra; (3) the rarifying and perforating ulcerative type; (4) chronic tympanic osteitis with hypertrophy of the mastoid; and (5) osteitis of the external auditory canal or of the temporal bone.

Case histories illustrative of these different types are given. In discussing the clinical interpretation of these types the authors emphasize their diverse localization.

The five cases reported were all characterized to a greater or less extent by symptoms which warranted a diagnosis of tuberculosis and four of the patients

died of tuberculous cachexia. The fifth seems to have local tuberculosis and shows the classical symptoms of tuberculous osteitis.

No general line of treatment is applicable to all of the different types described. If simple chronic otorrhœa is present and it is impossible to clean out the cavities completely, extensive local treatment seems only to aggravate the condition. The authors therefore conclude that the local condition should not be disturbed and that therapeutic measures should be directed toward improving the patient's general condition. In some instances, however, surgery is demanded by the complications.

W. A. BRENNAN.

Lemaitre, F.: Exclusion of the Subarachnoid Space (*Exclusion des espaces sous-arachnoïdiens*). *Rev. de chir.*, Par., 1919, lvii, 497.

The dangers incident to brain surgery are due particularly to the presence of the meninges. If the meninges can be walled off, the prognosis is very much improved. Such a walling-off may be effected by the spontaneous or induced formation of adhesions. Like every other serous membrane, the meninges defend themselves by forming adhesions and in this way block off the subarachnoid space. The surgeon should always respect such adhesions and, if necessary, reinforce them.

When the meninges are in a normal condition they can be made to become fibrous at any chosen point. The surgeon should induce such a fibrosis when he proposes to approach the brain. The bistoury should never be used or the meninges incised. Only a Pravatz needle is inserted into the meninges at the point where the brain effusion is believed to be. When a drop of pus issues, the needle should be replaced by a cannula and the orifice slightly enlarged. A drain of very small caliber should then be inserted without injuring the edges of the orifice and left in place for from twenty-four to forty-eight hours. This will act not only as a drain but also as a foreign body and by its irritation will produce meningeal adhesions. Following the first intervention the orifice should be gradually enlarged and the fibrosis extended.

According to the author, this method prevents meningitis in the same way as a generalized peritonitis is prevented in cases of abscess of the appendix. It finds its application in the treatment of cerebral or cerebellar collections of any kind and also in other types of brain surgery such as the extraction of foreign bodies.

W. A. BRENNAN.

Adson, A. W.: The Surgical Treatment of Trifacial Neuralgia. *Northwest Med.*, 1920, xix, 6.

The author believes that patients suffering with trifacial neuralgia have a very definite symptomatology and that treatment should follow one of three courses:

1. Alcohol injection into the peripheral branches. This is indicated occasionally at the onset of the neuralgia in the cases of feeble patients who are

poor operative risks and those who are being prepared for the radical operation. While it is a palliative measure only, the average time of relief afforded is nine months.

2. Avulsion of the peripheral branches. This treatment also is only a palliative procedure, affording relief continuing for about eight months. It is more difficult to repeat than the alcohol injection.

3. Physiological extirpation of the ganglion or division of the posterior root. Although avulsion of the posterior root relieves the pain permanently, it is ordinarily attended by two serious complications: (1) occasional seventh-nerve paralysis due to trauma at the exit of the root from the pons, and (2) frequent atrophic interstitial keratitis due to injury of the inner portion of the gasserian ganglion supplying the ophthalmic branch.

The technique employed by the author in cutting the sensory root of the gasserian ganglion differs from the usual technique in that the *dura propria* covering the ganglion is not divided except over the posterior root, and the ganglion is not exposed during the dissection except at the posterior margin. The posterior root is cut with a guillotine knife on the crest of the petrous bone and a small pledget of muscle is inserted into the dural foramen, pushing the proximal end of the posterior root back into the posterior fossa. In this way injury to the pons and ganglion, particularly the portion supplying the ophthalmic branch, and seventh-nerve paralysis are avoided and the frequency of atrophic interstitial keratitis is greatly diminished.

Blair, V. P.: Cleft Palate and Harelip. *Internat. J. Orthodont. & Oral Surg.*, 1920, vi, 43.

Blair holds that from the standpoint of appearance, health, function, and mental development the earliest possible closure of facial clefts is demanded and this closure should disturb the normal anatomy as little as possible.

In complete cleft of the lip and palate, either single or double, the cleft is as wide as the alæ of the nose will permit and the premaxilla is sprung forward, but comparatively little tissue is missing.

Early closure of the lip over an open alveolar arch will cause the cleft to contract and eventually close, and gives very good contour to the arch.

The Brophy operation allows an earlier satisfactory closure of the lip and palate but efforts must be limited to closing the arch with the best possible relationship between the premaxilla and the maxillæ. The former should be placed in front of the latter in order to improve the shape of the lip, the latter being approximated anteriorly to render the cleft as narrow as possible at that point. The posterior part of the cleft remaining should not be disturbed.

In a single cleft there may be spontaneous retraction of the premaxilla and closure of the alveolar cleft, but this does not occur in a complete double cleft. Proper early replacement in double cleft may produce some snubbing of the nose and

slit-like nasal openings, but these defects disappear with subsequent growth.

The most desirable time to do a Brophy operation is within the first two days of life. Usually it is not applicable after three months. The posterior part of the cleft in the hard and soft palate, however, can be closed any time within seven months to a year.

Closure of the lip will hasten narrowing of the cleft but will take longer than after a Brophy operation and repair is not apt to be so satisfactory over an open alveolar cleft as over an intact arch.

The author illustrates his points with numerous photographs and drawings. LOUIS SCHULTZ.

NECK

Dubois M.: Supernumerary Cervical Ribs (*Côtes surnuméraires cervicales*). *Arch. méd. belges*, 1919, lxxii, 40.

As a rule the local symptoms due to the presence of a cervical rib are not marked. In certain cases in which symptoms of compression have suggested the presence of cervical ribs the X-ray has demonstrated that the compression was due to clavicular exostosis, an exostosis of the first thoracic rib, or a tumor of the vertebral column. On the other hand, the X-ray has seemed to show the presence of a cervical rib causing compression of vessels and nerves in cases which later were proved to be Raynaud's disease or syringomyelia. In other cases both syringomyelia and a cervical rib have been found.

In the present state of X-ray technique it is impossible to determine in which of the organs compressed by the cervical rib the symptoms originate. Consequently radiography cannot demonstrate definitely which is the cause and which the effect when a cervical rib and nervous and vascular disturbances are associated.

The symptoms of cervical rib usually appear late in life; in the author's cases between the twenty-first and fortieth years. In the cases reported in the literature they were noted between the seventh and fourteenth years of age in 6, between the fifteenth and twentieth years in 16, between the twenty-first and thirtieth years in 12, between the thirty-first and fortieth years in 11, and in the sixty-second year in 1.

It is probable that the appearance of the symptoms is closely related to ossification but external factors may cause their rapid development by altering the relations between the cervical rib and its immediate surroundings.

The author does not agree with Schwartze who believes that a cervical rib demonstrated by radiography and causing marked symptoms should be surgically removed. The operation is difficult, and transient or permanent paralysis of the brachial plexus may result. Hence Dubois is of the opinion that the indications for surgery must be very imperative to outweigh its possible untoward results.

W. A. BRENNAN.

Cyriax, E. F.: Incomplete Luxation of the Cervical Vertebrae (Les luxations incomplètes des vertèbres cervicales). *J. de chir.*, 1919, xv, 457.

The author deals only with partial deviations of the cervical vertebrae. These are due usually to direct injuries of the head or neck, or to falls. Whether the luxation is complete or incomplete depends upon the degree of the injury. In a subluxation the vertebra is in a state of repose and a position which it would have assumed normally as the result of some determined movement. In a luxation these normal limits are passed and the displaced bone is in a position beyond the physiological limit of normal movement. In either case, unless there are strong adhesions or an ankylosis, the displaced bone is not immediately fixed and there is always a certain amount of mobility which varies with the direction and the degree of the displacement. The deviations may be multiple, a number of vertebrae being affected, and of different types, the types varying according to whether flexion or extension is present.

The symptoms, pathology, and treatment are dealt with by the author in detail and case histories with illustrations are added.

Cyriax is of the opinion that the incomplete luxations of the cervical vertebrae are much more frequent than is believed. Although the symptoms of subluxations, and more rarely of luxations, may not be very noticeable, they are generally characteristic and even when slight are easily detected. When the condition remains undetected it is because a search has not been made for it. As a rule displacements of the cervical vertebrae may be reduced by appropriate movements. Reduction is painless or only slightly painful and when it is effected the symptoms due to the displacement disappear.

A systematic examination of the region of the neck should be made in every case of craniocervical injury.

W. A. BRENNAN.

Boggs, R. H.: The Treatment of Goiter with Radiation. *Am. J. Roentgenol.*, 1919, n.s. vi, 613.

All forms of exophthalmic goiter are benefited by both roentgen and radium treatment, and unless the disease is too far advanced the symptoms may be relieved or a symptomatic cure may be effected in 80 per cent of the cases.

The roentgen rays are of value also in reducing the hyperactivity of the thyroid gland in exophthalmic goiter before operation when the tumor is large and the symptoms are so intense as to make operation dangerous. In such cases it is advisable to operate within from four to six weeks after the roentgen-ray treatment, before fibrous-tissue formation has taken place.

In relapses after operation for exophthalmic goiter radiation rather than a second operation should be resorted to after a careful study of the ductless glands.

Cases of exophthalmic goiter in which other ductless glands play an important part, particularly if

the thyroid is small or of moderate size, should be given radiotherapy.

Adolescent goiters which do not respond within a reasonable time to medical treatment are benefited by radiation.

As contra-indications for roentgen treatment are mentioned: (1) colloid, cystic, fibrous, and nodular goiter; (2) goiter causing marked pressure without toxic symptoms; and (3) intrathoracic goiters.

The author lays stress on the importance of properly selecting cases for radiotherapy and states that such selection is dependent upon the competence and experience of the radiologist.

As in some cases there is coincident involvement of the thymus or ovaries, simultaneous treatment of these glands may be beneficial. Both radium and the roentgen rays have a pronounced effect on glandular or epithelial cells which varies with the dosage. Hence to obtain the desired effects, care is necessary. Benefit may be obtained in cases of adolescent goiter, simple goiter, and exophthalmic goiter. In the last-named, improvement is noted in the pulse rate and nervous symptoms, and there is an increase in weight. The majority of the cases show also improvement in the exophthalmos and a greater or less reduction in the size of the goiter.

ADOLPH HARTUNG.

Boothby, W. M.: The Value of the Basal Metabolic Rate in the Treatment of Diseases of the Thyroid. *Med. Clin. N. Am.*, 1919, iii, 603.

By basal metabolism is meant the normal heat production of an organism measured twelve to eighteen hours after the ingestion of food, the organism being at complete muscular rest. It may be estimated by direct calorimetry or indirectly by the analysis of the end-products of oxidation within the organism. The author uses indirect calorimetry in his studies.

In a large group of diseases there are marked changes in the amount of heat produced. The most decided variations are found in the diseases of the thyroid gland. In hyperthyroidism the basal metabolic rate may be double that of the normal, whereas in hypothyroidism it may be as low as half that of the normal. The degree of variation from the normal indicates definitely the degree of hyperthyroidism on one hand or the degree of hypothyroidism on the other.

Three cases are reported to show the value of estimating the basal metabolic rates in the diagnosis and treatment of mild hyperthyroidism superimposed on a neurosis, well-marked hyperthyroidism, or hypothyroidism.

When the basal metabolic rate falls as low as 35 or 40 per cent there is complete absence of function in the thyroid gland. A single dose of 15 mgs. of thyroxin in such cases will bring the rate up to about 10 per cent, that is, to within the limits of normal variations. The maximum effect of the thyroxin is reached at the end of the second week after its administration. Several weeks elapse before

its full effect wears off. When once a case of advanced hypothyroidism is brought up to within normal variations, a daily dose of approximately 1 mg. of thyroxin is required to maintain a normal rate.

G. S. FOULDS.

Greenberg, D.: Metastatic Abscesses of the Thyroid Associated with Hyperthyroidism; Report of a Case Following Repeated Attacks of Sore Throat. *J. Am. M. Ass.*, 1920, lxxiv, 165.

A condition which was diagnosed as hyperthyroidism and in which there had been repeated attacks of sore throat, proved at operation to be due to multiple abscesses of the thyroid gland. Following a full report of this case, the author draws these conclusions:

1. Thyrotoxic symptoms may appear in cases of simple goiter as the result of acute infection.

2. Bacteria may be a factor in the causation of exophthalmic goiter; if not directly, at least by effecting such changes in the physiology of the gland as to make the development of exophthalmic goiter probable.

3. Suppuration of the thyroid gland should be suspected when there is even slight pain and tenderness of the gland with enlargement, and especially when there is a history of infection. K. L. VEHE.

Crile, G. W.: The Surgical Treatment of Exophthalmic Goiter. *Surg., Gynec. & Obst.*, 1920, xxx, 27.

The conclusions presented are based upon the author's personal experience in 2,250 thyroidectomies of which 1,169 were for exophthalmic goiter. In 660 cases of exophthalmic goiter ligation was done. No case was rejected for operation unless the goiter was in the state of dissolution. In post-operative hyperthyroidism the cause of death is excessive chemical activity. The author always does a ligation in the patient's room under nitrous-oxide analgesia and local anæsthesia. In certain serious cases the lobectomy also is done in the patient's room.

The following are the principal factors in Crile's system of management:

1. The differential diagnosis is greatly aided by the Goetsch test and metabolism determinations.

2. The operative procedures are modified according to the severity of the disease.

3. The inhalation anæsthetic is nitrous oxide-oxygen which is administered while the patient is in bed. The operation is performed in the patient's room or after his transportation to the operating room after the induction of anæsthesia.

4. In moderate cases the entire operation may be done at one time.

5. In more severe cases the thyroid activity is diminished by a preliminary ligation while the patient is in bed under nitrous oxide-oxygen analgesia and local anæsthesia.

6. In extremely grave cases it may be necessary to diminish the thyroid activity by multiple steps:

ligation of one vessel; ligation of the second vessel; and partial lobectomy. Intervals of a month or more are allowed to elapse between these stages, the length of each interval being determined by the degree of physiological adjustment.

7. If during the operation the pulse runs up beyond the safety point, the operation is halted and the wound is dressed with flavine. The operation is then completed after a day or two when conditions have again become safe. In some cases, even though the thyroid has been resected, it is thought advisable to dress the unsutured wound with flavine and make a delayed suture while the patient is in bed the following day under analgesia.

8. In certain cases lobectomy is performed while the patient is in bed and under nitrous-oxide analgesia and local anæsthesia.

9. Psychic control of the patient on the part of the surgeon, the interne, the anæsthetist, and the nurse is required throughout to diminish the intense drive. An associated regimen is prescribed for the pre-operative, interoperative, and postoperative periods. The pre-operative and the postoperative management are equal in importance to the operation itself.

10. If after the operation the temperature becomes excessively high, and the pulse and respiration are greatly increased, the patient is promptly packed in ice.

11. To avoid the effects of too sudden withdrawal of thyroid secretion, thyroid extract is given the night before lobectomy.

In this paper only the immediate surgical management of exophthalmic goiter is considered but the author states that the postoperative management of these cases is of equal importance.

Because of the striking benefits which follow the operation, and in view of the fact that with a comprehensive surgical control the mortality rate is only 1.1 per cent and no case is rejected on account of its gravity, the status of the surgical treatment of exophthalmic goiter seems to be approaching that of the surgical treatment of acute appendicitis.

C. R. STEINKE.

Sistrunk, W. E.: The Selection of Operation for Exophthalmic Goiter. *J. Am. M. Ass.*, 1920, lxxiv, 306.

During recent years the mortality following surgical procedures in the treatment of exophthalmic goiter has gradually decreased because of earlier operation and wiser selection of the type of operation.

The course of the disease varies. In one type there is sudden onset and rapid development of symptoms. In such cases the patient soon becomes a poor surgical risk. More frequently, the onset is insidious, the symptoms developing gradually with the enlargement of the thyroid. The disease usually reaches its height in the second six months of its course when the so-called crisis is passed. After several weeks these patients are improved, but are never so well as formerly. In most cases a second

and third crisis will develop, resulting in degenerative changes in the heart, liver, and kidneys. A third type of the disease is chronic from the onset and without crisis.

While preliminary medical treatment is of advantage, the prolongation of such treatment is to be deplored as it affords opportunity for the development of degenerative changes which surgery cannot overcome.

In regard to operation, each case must be judged on its own merits. When at the Mayo Clinic the patient is seen early, a diagnosis of exophthalmic goiter plus hyperthyroidism is usually followed by a primary thyroidectomy with the removal of one whole lobe, the isthmus, and from one-half to two-thirds of the other lobe.

The metabolic rate is of great aid in the diagnosis of early exophthalmic goiter. As a rule the pulse rate, pulse pressure, and metabolic rate are parallel. Some patients with a high metabolic rate, however, stand operative procedures well, while others with comparatively low rates are poor surgical risks. Usually when the rate is from 60 to 70 per cent above normal and there is no marked cardiac damage, a preliminary ligation is done. If the reaction which follows is mild, thyroidectomy is performed in seven or eight days; if severe, a second ligation is done after the same interval and thyroidectomy is delayed for three or four months.

In the cases of patients with a high metabolic rate who have been ill with the disease for several months and have become irritable, nervous, and weak, two superior-pole ligations are done at intervals of from seven to eight days, and thyroidectomy from three to four months later.

In cases of acute crisis the best treatment consists of rest, the administration of fluids, and careful nursing until the crisis is passed. Following the crisis there is a considerable drop in the metabolic rate but because of degenerative changes the patients are poor operative risks and therefore should be treated by two superior-pole ligations at the usual intervals.

In certain very severe cases the injection of hot water or quinine and urea hydrochloride solution directly into the gland will make ligation possible.

Ligation is done for two reasons: first, to test the patient's reaction to operation, and second, to prepare him for thyroidectomy. Those who withstand a ligation well will usually withstand thyroidectomy well.

When a reaction follows operation it consists of an increase in the pulse rate and temperature, vomiting, nervousness, and mental irritability. It begins a few hours after operation and reaches its height in from thirty-six to forty-eight hours. In some instances it may cause death, but usually it subsides after from forty-eight to seventy-two hours. If the reaction after ligation is marked, a second ligation is done.

The improvement following thyroidectomy depends upon the extent of the previous damage to the vital organs and the amount of thyroid tissue removed. The operation usually stops the hyperthyroidism but cannot repair the damaged organs. If the metabolic tests indicate that the amount of gland removed was not sufficient or if the gland tissue remaining becomes hypertrophied, more of the gland should be removed to bring the metabolic rate to normal.

J. A. H. MAGOUN, JR.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Moschcowitz, A. V.: Empyema, with Particular Reference to its Pathogenesis and Treatment. *Surg., Gynec. & Obst.*, 1920, xxx, 35.

In refuting the prevalent idea that infections of the pleura are due to contiguity Moschcowitz draws an analogy between pleural infections and infections of the peritoneum. Diffuse peritonitis occurs rarely unless some intra-abdominal viscus has been perforated or, as in the case of the appendix, its walls have been so necrosed as to permit the easy transition of bacteria to the peritoneal cavity.

In most instances empyema results from the rupture of a small subpleural abscess. As operation does not permit sufficient exposure to demonstrate this pathogenesis, it is necessary to seek a confirmation of the belief in autopsy material. This Moschcowitz was able to do in the army. In a great many instances in a series of over three dozen autopsies he demonstrated the presence of one or

more subpleural abscesses and in some of these cases the abscesses had perforated into the pleura.

Empyema is the final stage of a process in which the first stage is a serous pleurisy and the second stage a seropurulent pleurisy. The latter is the so-called "formative stage" of the empyema. In the formative stage there are no recent pleural adhesions, but in the acute stage they are always present.

In by far the greater number of cases the empyema is of the encapsulated variety. The entire pleural space is occupied in only a very few. The localization of the empyema depends entirely upon the situation of the ruptured subpleural abscess. If it is general or diffuse, the abscess is usually located on the convex surface of the lung. If the abscess is in a fissure, an interlobar empyema results. When the abscess is on the mesial surface of the lung, there are retrosternal pus pockets between the lung and the mediastinal pleura.

The treatment of empyema should be begun in the formative stage before the exudate has been

converted into pus, but it is unwise to perform an operation in this stage. The mortality is very high because of the associated pneumonia and because, in the absence of adhesions, there is an acute pneumothorax with fluttering of the mediastinum and consequent embarrassment of the heart action. The best surgical procedure in the formative stage consists of repeated aspirations done as often as indicated to relieve the embarrassment due to the mechanical pressure of the rapidly accumulating fluid. In a few cases this measure is curative.

In the acute stage of empyema the treatment consists of simple intercostal thoracotomy. This operation need not be considered urgent and should be performed only when the patient's condition is otherwise perfectly satisfactory.

The Carrel-Dakin treatment has proved of great value in the postoperative treatment of empyema and should be instituted in every case.

Empyema cavities heal in three ways: (1) by the formation and absorption of a sterile exudate; (2) by the formation and absorption of a closed pneumothorax; and (3) by the classical method, i. e., expansion of the lung and obliteration of the pleural cavity.

Chronic empyema would not occur at all or at least would become very rare if the methods here described for the treatment of acute empyema were more generally used.

Recurrences of empyema are usually the result of undue haste in closing the thoracotomy opening. The percentage of recurrence is less after the Carrel-Dakin method of treatment than after any other.

H. A. MCKNIGHT.

Ransohoff, J.: Empyema at the Cincinnati General Hospital during the Influenza Epidemic. *J. Am. M. Ass.*, 1920, lxxiv, 238.

The empyema record of the Cincinnati General Hospital shows a mortality of 9 per cent in the 46 cases operated upon from Oct. 1, 1918, to May 1, 1919.

The treatment in all cases consisted of drainage with immediate occlusion of the pleural cavity.

The chief points made by Ransohoff in his discussion are summed up as follows:

1. Empyema complicating influenza is in itself not responsible for death. Too early operative measures should be avoided or limited to simple aspiration.

2. Operation not earlier than the end of the second week gives the best results. Rib resection is indicated only when sufficient space is not obtained without it.

3. General anaesthesia is not necessary in most cases but does not increase the mortality rate of the operation.

4. The old methods of drainage should be discarded for some type of the occlusion method by which the entrance of air into the pleural cavity is prevented and the egress of pus is facilitated. A suction apparatus attached to the tube is necessary.

5. Flushing the cavity with Dakin or other solution is unnecessary except when defervescence does not occur, indicating that spontaneous sterilization of the cavity is not progressing normally.

6. The small pneumothorax which sometimes remains after the healing of a cavity, as demonstrated by the X-ray, is negligible as it disappears spontaneously in a short time. K. L. VEHE.

McGlannan, A.: The Failure of Restricted Operations in Cancer of the Breast. *West Virginia M. J.*, 1920, xiv, 247.

In 1888 Halstead published his article on the radical removal of the breast with drainage of the lymph glands and channels. Several years later Meyer, working independently, published an account of his operation. Since then the tendency has been to increase the amount of tissue removed.

In recent years the most important contribution on the subject was that of Handley who, after a careful study of the lymphatics of the breast and the permeation of cancer cells, recommended the removal of the fat and fascia of the upper external oblique and rectus muscles. McGlannan's technique is as follows:

An incision through the skin is made around the breast about $2\frac{1}{2}$ in. from the margin of the tumor with radiating incisions to the shoulder and umbilicus. The skin flaps are then dissected back free from fat until an area is cleared from the clavicle to the umbilicus and from the midsternum to the border of the latissimus dorsi. The fat is next cut through and both fat and fascia are dissected back until the muscles are exposed. The pectoralis major and minor are divided, a small bunch of muscle being left attached to the humerus. The axilla is cleared of glands and the subscapular and subclavicular spaces are freed from fat, the mass being liberated by division at the sternal margin. Usually an area 2 in. in diameter is left uncovered by skin. Skin grafts are not used as this region is subjected to X-ray treatment which would destroy them.

A report of the postoperative course in 92 cases is given. The average number of cures amounted to 40 per cent. I. E. BISHKOW.

PHARYNX AND OESOPHAGUS

Patterson, E. J.: Cancer of the Oesophagus. *Pennsylvania M. J.*, 1919, xxiii, 147.

With the development of radiography, fluoroscopy, and oesophagoscopy there is no excuse for permitting carcinoma of the oesophagus to progress to a hopeless stage.

The earliest symptoms of this disease are so insidious in their onset and so insignificant in character that they arouse little suspicion or anxiety on the part of either the patient or the physician. In the majority of cases the patient first experiences difficulty in swallowing a bolus of food. This gradually increases so that finally he finds it difficult to

swallow even liquids. As a result, malnutrition begins and there is great loss in weight. It is at this hopeless stage of the disease that most patients first consult a physician.

The author quotes Jackson as follows: "Unfortunately malignant disease of the œsophagus is but rarely seen early. There are two reasons for this. First, the early stage of the disease produces no symptoms; second, when symptoms begin to appear they are so slight that usually neither patient nor physician suspects serious disease. With a wider recognition of the usefulness of the œsophagoscope for early diagnosis there will be a change in this respect."

Before using the œsophagoscope it is of the greatest importance to rule out aneurism or marked obstruction of the œsophagus and therefore œsophagoscopy should always be preceded by a roentgen-ray examination. After the diagnosis has been made the treatment will depend greatly upon the site and the extent of the involvement. In the very early cases of cardiac or cervical involvement surgery offers great hope for cure. When there is involvement of the mediastinal glands or the mediastinal portion of the œsophagus, however, radical measures are out of the question. In such cases the use of radium or the roentgen ray is indicated, and if it is not too late, gastrostomy as a palliative measure.

In conclusion the author emphasizes the importance of using the œsophagoscope in all cases in which there is the slightest abnormality in swallowing. He reports three cases of œsophageal cancer, giving a radiograph of each which shows the marked constriction of the œsophagus distinctly.

LOUIS HANDELMAN.

MISCELLANEOUS

Harrison, C. R., and McKelvey, D.: A Case of Mediastinal Tumor Associated with Acute Leukæmia. *Lancet*, 1920, cxcviii, 252.

The patient was a man, 29 years of age, who previously had been in good health and had served in the army continuously from August, 1914, to April, 1919. On May 31, 1919, he fell ill with pain and discomfort in the epigastrium and occasional vomiting following the ingestion of food. Toward evening his temperature rose to 99 degrees F. On June 20 a sudden swelling due to thrombosis developed in the left arm.

When he was first seen by Harrison and McKelvey, June 27, 1919, the patient was complaining of epigastric pain which increased at night and bore no definite relationship to the ingestion of food. The examination of the abdomen was negative except that slight epigastric tenderness was discovered. The respiratory system was subjectively negative but percussion revealed an area of intense dullness in the midline from the clavicle to the heart, which extended 2 in. to the right and 1 in. to the left of the sternum. No dullness was noted posteriorly.

The X-ray examination showed an opaque mass behind the sternum, which was non-pulsatile and did not move with the respiration. This mass corresponded to the area of increased dullness. The spleen and lymph glands were not enlarged.

A blood count showed 5,600,000 red blood cells and 86,000 leucocytes per cubic millimeter. The differential count showed polymorphonuclear neutrophils, 3 per cent; polymorphonuclear eosinophiles, 0.5 per cent; large mononuclear cells 96.0 per cent; and neutrophile myelocytes, 0.5 per cent. Small lymphocytes and normoblasts were few.

The patient grew gradually weaker, dyspnoic, and cyanotic, and died July 22. The day before his death the blood count showed 4,100,000 red blood cells and 210,000 leucocytes per cubic millimeter.

At autopsy a large mass, white, very tough, and about the size of a coconut, was found in the mediastinum spreading down over the heart and enveloping the borders of the lungs. Posteriorly it had infiltrated the lungs and bronchial glands. No metastases were discovered. Microscopically the tumor mass showed cells resembling leukæmic cells of the blood supported by a stroma which in places was dense and hyaline. No evidence of thymic tissue was found. The spleen was slightly enlarged and with the liver and the general lymphatic glands showed leukæmic infiltration. The bone marrow of the sternum showed masses of leukæmic cells together with megacaryocytes, myelocytes, and erythroblasts.

This case is of interest because of the extreme rarity of the condition and also because of a possible relationship between the leukæmias, lymphadenomata, and lymphosarcomata. Sternberg held that there are two distinct conditions: (1) an increase in the cells of the small lymphocyte type with hypertrophy of the lymphatic apparatus, that is, lymphatic leukæmia, and (2) mediastinal leukosarcomatosis. In Fraenkel's opinion the second condition is simply a leukæmia with a tendency to form tumor-like masses of cells.

A remarkable feature presented by the case reported was the high proportion of red cells up to the time of death, i.e., 4,100,000, as compared with an average of 1,500,000 in a number of cases cited.

K. RENSCHAW.

Novaro, R.: A New Sign of Neoplasms of the Pleura, Mediastinum, and Lung (Consideraciones sobre un nuevo signo en las neoplasias pleuro-mediastino-pulmonares). *An. d. Inst. mod. de clín. méd.*, 1919, iv, 134.

In the spring of 1919 Novaro reported three cases which presented what he considers a new sign of neoplasms of the pleura, mediastinum, and lung. At that time, however, he was unable to obtain an autopsy. In this article he reports a case in which the sign was verified by autopsy.

In a subject without skeletal deformity the jugulo-umbilico-pubic line passes through the middle of the sternum and its xiphoid process.

Pitre's sign, which was first studied in pleurisy with effusion, consists of a displacement of the sternum toward the side containing the exudate. Except in cases of skeletal deformity this sign is always constant in pleurisy with effusion, but has been observed also in splenopneumonia, pneumothorax, unilateral emphysema, and pulmonary congestion.

Novaro's sign of pleural, mediastinal, and pulmonary neoplasms is exactly opposite to Pitre's sign for it consists in the deviation of the sternum toward the healthy side or the side of the chest that is least involved.

When a cancer begins at the hilum of the lung a thickening of the wall of the bronchus and a marked diminution of its lumen are observed. Spreading through the lung which surrounds this portion of the bronchus, the growth thus prevents a good part of the healthy lung from functioning. If the propagation is by way of the lymphatics, it follows the course of the bronchus, forming a sheath which obstructs the bronchial lumen at many points, extends to the pleural surface of the lung which it invades, and gives rise to the characteristic exudate. If the principal development of the growth is along

the main bronchus, the respiratory capacity of a great portion of the lung is diminished by compression of the bronchus, the organ on the opposite side is compelled to do more work, and thus the sternum is deviated to the opposite side. The same phenomena take place when the neoplastic propagation produces a carcinomatous lymphangitis or when the cancer develops within the lung and causes the formation of a rounded and circumscribed tumor.

If the infiltration is diffuse it assumes the aspect of a caseous pneumonia involving a whole lung lobe. On microscopic examination the alveolæ are found to be infiltrated and some are compressed throughout the extent of the neoplasm. In the carcinomatous lesions of the lower lobes with propagation on the diaphragmatic pleura paralysis of the diaphragm is a constant complication which tends to exaggerate the sign described.

The article contains an X-ray picture of the patient; a photograph of the left lung and of the anterior aspect of the body, showing the deviation of the sternum toward the healthy side; photomicrographs of the cancer; and a detailed description of the case.

M. M. MATTHIES.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Worms, G.: The Treatment of Gunshot Wounds of the Sacro-Iliac Articulation (*Traitement des plaies de l'articulation sacro-iliaque par projectiles de guerre*). *Bull. et mém. Soc. de chir. de Par.*, 1919, xlv, 1351.

Worms gives short clinical histories of 9 cases of gunshot wounds of the sacro-iliac articulation.

In general, this lesion involves only one bone, most frequently the ilium. The fractures are of several varieties. In punctiform wounds there is a simple osseous tunnel in the spongy tissue of the tuberosity of the ilium or in the sacrum.

Concomitant visceral lesions may be present and a search should always be made for them. Crushing and fissuring injuries cause all varieties of bone lesions from simple depression of the bone with contusion of the spongy tissue to complete rupture of the tuberosity of the ilium.

Acute or chronic osteomyelitis is the chief complication in these wounds and is quickly followed by sacro-iliac arthritis. The purulent masses formed are diffused toward the internal iliac fossa and the sacrolumbar region. The clinical evolution of suppurative arthritis may be very insidious but local pain should at once suggest it.

The prophylactic treatment of articular infection should consist of excision of contused and contaminated bone tissue, removal of loose pieces of bone and foreign bodies, and thorough cleansing of the infected area. Frequently an atypical resection

about the tuberosity suffices, but the extent of the lesion may justify total primary sacro-iliac resection.

Worms has employed Picque's sacrocoxalgia incision. This is made along the posterior third of the crest of the ilium and continued to the third postero-external sacral tubercle and the edge of the sacrum. As it does not give sufficient exposure, however, Worms makes an additional flap in the gluteal muscles as recommended by Auvray.

The articulation should be partially resected, the anterior ligamentous periosteal sheath being spared if possible in order to preserve the continuity of the pelvic girdle.

Good results were obtained in 8 of the 9 cases treated by the author; in 3 of these cases the joint was resected.

W. A. BRENNAN.

Quain, E. P.: The Technique of Inguinal Herniotomy; with Special Reference to the Closure of the Internal Ring. *Surg., Gynec. & Obst.*, 1920, xxx, 88.

The author calls attention to a few anatomical and technical points which are of special importance in obtaining 100 per cent permanent cures in the radical operation for indirect hernia.

There are four general causes of failure: (1) leaving the stump of the sac too long; (2) failure properly to close the internal ring; (3) leaving too much unnecessary tissue attached to the cord within the internal ring; and (4) allowing the patient to resume work too early.

The anatomy of the parts is given in detail.

The cremasteric muscle must always be dissected free from the cord and Poupart's ligament if it is too bulky. At the close of the operation it is attached to the external oblique aponeurosis.

The sac will be found between the vas and the artery. The most important step in herniotomy is the freeing of the base of the sac from the surrounding structures within the internal abdominal ring. Care must be taken in ligating not to confuse the scar-like area or constriction so often found near the neck of the sac with the neck which lies from $\frac{1}{2}$ to 1 in. higher.

Under tension upon the sac a triangle is developed with the peritoneum above, the vas being mesial and the blood vessels on the outside. Dissection is complete only when this triangle can be demonstrated.

If the internal ring will admit the index finger it should be closed by suturing the internal oblique and transversalis muscles to the lower margin of Poupart's ligament between the vas and the vessels. The space allowed around each structure should be merely enough to prevent compression, i.e., about $\frac{1}{8}$ in. The conjoined tendon should then be sutured to Poupart's ligament below the vas and the cord placed on its new bed. In all cases, care must be taken that no tissue intervenes between the structures sutured.

The same sutures may be used to suture the external oblique aponeurosis over the cord to Poupart's ligament.

The patient should be informed that his groin will remain weak for from two to four months after the herniotomy.

Clean dissection, careful control of all bleeding, gentle handling of tissues, and asepsis are essential to success.

P. M. CHASE.

GASTRO-INTESTINAL TRACT

Gillon, G. G.: A New Pylorus. *Lancet*, 1920, cxcviii, 251.

Braun, Weir, and Jaboulay performed the operation described in conjunction with anterior gastrojejunostomy over twenty years ago. It has been done several times in England since then, combined with a long loop posterior gastrojejunostomy, but fell into disfavor because of the occurrence of jejunal ulcer and the length of time required to perform it.

The author states that when, in addition to a posterior gastrojejunostomy placed so that the opening is at the lower end of the stomach, a jejunostomy is placed $3\frac{1}{4}$ in. from the new pylorus, the food stream will be prevented from mingling with the bile and pancreatic fluids and the duodenum will be given a complete rest.

The first 3 in. of the proximal loop of the jejunum is used for the first anastomosis and the remaining 7 in. for the second anastomosis. The gastrojejunostomy is made 3 in. in length. The jeju-

jejunostomy is made $1\frac{1}{2}$ in. in length and at a point $3\frac{1}{2}$ in. below the stomach. The gastrocolic omentum is attached to the jejunum near the stomach with silk or fine linen. Not more than one hour and fifteen minutes should be consumed in performing this operation. Afterward only water and peptonized milk should be allowed for about eight days. From 2 to 3 gr. of calomel should be given on the twelfth day. The patient should lie on his back for twenty-one days. The author reports good results from this operative technique.

J. A. H. MAGOUN, JR.

Crohn, B. B., and Reiss, J.: The Effects of Restricted (So-Called Ulcer) Diets upon Gastric Secretion and Motility. *Am. J. M. Sc.*, 1920, clxx, 70.

This study is limited to the direct results upon the chemism and motility of the stomach of various forms of medical treatment. Thirty-four patients (5 with gastric or duodenal ulcer as demonstrated by later operation, 21 with clinical ulcer, and 8 with clinical gastric neurosis) were observed over a period of from two to five weeks.

Following the recording of the history, a physical examination, tests for occult blood in the stool, and radiographic and fractional meal examinations, the patient was placed on a Lenhart or modified Sippy diet and kept in bed for from two to four weeks or longer. Fractional test-meal examinations were made at intervals to determine the effect of the restricted diet and bed-rest on hyperacidity, hypersecretion, and motility, respectively.

It was found that bouillon acted as a mild digestive stimulant and did not bind acid while milk acted as a strong acid stimulant and was emptied through the pylorus slowly. A combination of milk and egg proved to be a powerful stimulant to gastric secretion, causing hyperacidity and hypersecretion, and delayed the emptying time.

In the 34 cases, medical treatment effected a net reduction of acidity in 13 (38 per cent.) and 12 of these patients were discharged free from symptoms. On the other hand, of 25 patients discharged from the hospital free from symptoms and apparently well, 13 retained the degree and type of acidity noted on admission. Accordingly, either a small percentage of ulcer cases react to medical treatment by a reduction of acid during digestion or else clinical improvement may take place independently of the relief of hyperacidity.

As regards hypersecretion a similar conclusion was reached. Of 20 patients with hypersecretion, 9 (45 per cent) were freed of this condition. Of the remaining 11, however, 6 left the hospital apparently well. Half of the clinically cured patients still showed hypersecretion.

There were 13 cases of delayed motility; in 11 (85.4 per cent) medical treatment improved this condition and all of these patients were clinically benefited. The 2 patients with unimproved delayed motility were not benefited clinically. In

no case of associated hypersecretion and delayed motility could improvement be ascribed solely to a reduction of acid secretion.

The majority of cases, however, showed no evidence of delayed motility; hence, relief of the symptoms must have been due to other factors beside the relief of pylorospasm.

The authors suggest that a possible solution of the clinical benefit obtained in cases not showing delayed motility may be found in radiographic studies which have demonstrated the close relationship between subjective pains and hyperperistalsis or hunger contractions. It seems probable that rest in bed and restricted diet exert a quieting influence upon gastric contractions, and that this reduction in tonus may or may not be associated with a reduction of acid and secretion.

The failure of medical treatment more frequently to reduce hyperacidity and hypersecretion may be due to a premature return to a more liberal diet including meat which, in the authors' opinion, should be excluded for weeks or even months. Restraint in the use of eggs is also desirable. Cereals may be introduced into the diet earlier and more liberally. Antacids should be used often and in small doses. The psychic factor should not be overlooked. Patients with advanced indurated ulcers and those with a marked neurosis resist treatment. The former require protracted care; the latter, the attention of a neurologist and often of a psychoanalyst.

W. H. NADLER.

Jean, G.: Periduodenitis and Its Relation to Lane's Disease (Le périduodénite et ses rapports avec la maladie d'Arbuthnot Lane). *Arch. de méd. et pharm. nav.*, 1919, cviii, 321.

Jean defines "periduodenitis" as a condition in which the duodenum is fixed by peritoneal adhesions and becomes abnormally kinked. Clinically it is manifested by digestive disturbances due to chronic duodenal stasis.

In discussing the pathogenesis, Jean describes the anatomical and physiological peculiarities of the duodenum. The first portion of the duodenum is related more closely to the gastrohepatic ligament than to the rest of the duodenum. It follows the movements of the pylorus and the only fixed point is at its angle of union with the second portion of the duodenum. Here Bruenner's glands are analogous to, if not identical with, those in the pylorus and have an acid secretion which is concerned in the principal pathologic lesion of this portion of the duodenum, i.e., ulcer. The pathology of the rest of the duodenum is different because of its different characteristics.

If it is remembered that the kinks are found especially in the second portion of the duodenum, that in ptosis of the pylorus the inner end of the first portion of the duodenum is pulled down, that the third portion of the duodenum is frequently subject to spasm and stenosis, and that the majority of the patients examined for this condition are affected

with ptosis, the development of periduodenal lesions is easy to understand. The causes are mechanical and physiological. Mechanically the kinks are formed where the traction is strongest. They occur at the union of the first and second portions of the duodenum because of traction on the pyloric end, and at the middle or lower part of the second portion of the duodenum, just about the mesenteric insertion, because of ptosis of the colon. They are found also at other points where traction may be exerted.

In the beginning the kinks are mobile and reducible, but owing to the constant irritation, thickening and adhesions develop which ultimately render them irreducible and give rise to duodenal stasis.

The differential diagnosis of periduodenitis from duodenal ulcer must depend principally on radiocopy. Although a juxtapyloric ulcer deforms the duodenum only slightly, ulcers in other portions of the duodenum give rise to more or less extensive deformities. Duodenal ptosis also favors the formation of ulcers. Hence the diagnosis is difficult and screen examinations and interpretations must be repeated and carefully controlled.

W. A. BRENNAN.

Taylor, G.: Prophylactic or Temporary Cæcostomy in Resection of the Distal Portion of the Colon for Non-Obstructive Conditions. *J. Roy. Army Med. Corps, Lond.*, 1920, xxxiv, 60.

The author reports upon and recommends temporary cæcostomy in cases in which resection of the colon is intended.

In cases of carcinoma without obstruction cæcostomy acts as a vent for the gases and prevents strain at or near the suture line. If the cæcum is simply anchored to the peritoneum, the opening closes readily enough when allowed to do so, especially if the drainage tubes are inserted after the method of a Senn gastrostomy.

In excision of the distal colon following such injuries as gunshot wounds, cæcostomy is an admirable addition for safety to the original operation. It is done at the end of the operation through a gridiron incision.

The detailed reports are given of four cases in two of which portions of the small intestine as well as of the large intestine were resected.

Stiles of Edinburgh is given credit for originating the procedure discussed.

T. W. CHASE.

Lockhart-Mummery, P.: Resection of the Rectum for Cancer. *Lancet*, 1920, cxcviii, 20.

Lockhart-Mummery's technique reduces shock and sepsis, the two most important sequelæ of operation for rectal neoplasms, to a minimum. During the last four years the author has removed the rectum for carcinoma in 65 cases with only 5 deaths. His operation is absolutely aseptic. Primary union was obtained in a number of cases and more frequently in women than in men. In women the pelvic organs readily fall backward and obliterate

the rectal cavity which otherwise would heal by granulation.

Gas and oxygen, or twilight sleep combined with local or spinal anaesthesia, was used in all cases to prevent postoperative shock and vomiting. Vomiting is particularly undesirable as it tends to break down the newly-formed peritoneal floor and to start secondary hæmorrhage. The operation is carried out most satisfactorily in cases in which the growth is situated at the anus or in the rectum proper as the risk is increased by fixation to important structures.

The operation is done in two stages. The first stage consists of a colotomy performed through the left rectus muscle. Two days later this is opened and the lower bowel is irrigated. The second operation is done eight or ten days later. The anus is sealed tightly before the operating field is prepared and in male patients a urethral catheter is tied in place as a guide. The rectum is then carefully freed in the front from the perineum upward. When the peritoneum is reached it is opened in front of the rectum. The bowel is divided between clamps with the cautery and the end is invaginated. In most cases no drainage was used but when it was employed it was removed in thirty-six hours.

The operation as carried out by the author is generally performed in thirty-five or forty minutes. In several cases it was necessary to remove the posterior vaginal wall and in two cases the greater part of the prostate.

No change in the usual diet is made, an ordinary meal of solid food being given as soon as the patient desires it. The postoperative results were very satisfactory. Out of a total of 17 patients whose wage-earning ability was investigated, 12 had returned to work within one year after operation.

A. J. SCHOLL.

LIVER, GALL-BLADDER, PANCREAS, AND. SPLEEN

Sauvé, L.: Five Cases in Which Projectiles Were Extracted from the Liver (Cinq observations d'extraction de projectiles intrahépatiques). *Bull. et mém. Soc. de chir. de Par.*, 1919, xlv, 1461.

In only one of the cases reported was the projectile removed immediately after the injury. In the other four it had remained in the liver for from ten to twenty-three months. In all cases the extraction was done under the control of the radioscopic screen. In only one instance was the operation indicated by the symptoms of secondary infection; in the others the indication was furnished by the pain caused by the projectile. In one case the extraction was done by the lumbar route; in the others, by laparotomy. The incision in the liver varied from 1 to 3 cm. in length according to the size of the projectile. The projectile was removed with the forceps. In no case was there any extensive hæmorrhage, but in one instance a pyopneumothorax developed following the operation.

Sauvé believes that it is no more difficult or dangerous to remove projectiles from the liver than to extract them from any other organ and that the liver is not any more able to stand their presence than any other organ. Such removal is indicated when the projectiles are large and cause persistent pain. The possibility of infection is alone an indication. If the projectile is small, however, or if it is centrally situated within the liver, it is best to leave it *in situ* as the operative risk in such cases outweighs the benefit which might be gained by surgery.

W. A. BRENNAN.

Reid, M. R., and Montgomery, J. C.: Acute Cholecystitis in Children as a Complication of Typhoid Fever. *Bull. Johns Hopkins Hosp.*, 1920, xxxi, 7.

The authors collected 18 cases of typhoid fever in children under the age of 15 who either died from, or were operated upon for, complications arising in the gall-bladder. In one case of the series the acute cholecystitis did not develop until eight months after recovery from the disease; in all the others, the complications came on during the course of the condition. Eight patients who died were not operated upon. All of these cases were reported prior to the year 1893. Since that time 10 cases treated surgically have been reported. There was one death, a mortality of 10 per cent.

The records of the earliest cases were not supported by bacteriological studies. In recent years, however, cultures of the gall-bladder were usually made at the time of operation. In this connection the leucocyte count was of interest. When the cultures showed a pure culture of the typhoid bacillus the count was relatively low, usually about 10,000. In one case in which cultures were not made there was a leucocyte count of 33,000, and in another case, which showed an organism not definitely identified, the count was 21,000.

In 1907 Thomas collected from the literature 154 cases of typhoid fever complicated by cholecystitis. Perforation of the gall-bladder occurred in 39 of these. Twenty-eight of the patients were not operated upon and died. Among 11 who were treated surgically the mortality was 54.6 per cent. In 1908 Ashhurst collected 21 cases of acute cholecystitis in which an operation was performed during the course of typhoid fever. Eight of the patients recovered. In 1916 Price collected 8 other operative cases and added one of his own, bringing the total number up to 30 cases. In Price's 9 collected cases there was only one death and this was due to intestinal perforation two weeks after the operation on the gall-bladder. In the surgical clinic of the Johns Hopkins Hospital the results were good. The 6 children treated surgically, whose cases are reported in this paper, all recovered. The good results in recent years the authors attribute mainly to the fact that the operations were performed before rupture of the gall-bladder and partly also to the fact that the surgical treatment is better.

The authors emphasize the importance of differentiating between gall-bladder complications that do and those that do not require surgical treatment. Slight pain and tenderness in the region of the gall-bladder associated with a slight degree of spasticity of the right rectus muscle were not very unusual during the course of typhoid fever and the vast majority of these patients got well. Operating on typhoid fever patients for minor symptoms of cholecystitis is only slightly less justifiable than operating upon all patients who have pain in order to prevent intestinal perforation. Nevertheless the low operative mortality justifies operation when there is grave doubt as to the nature of the condition of the gall-bladder. Acute suppurative typhoidal cholecystitis should receive immediate surgical treatment for in such cases rupture of the gall-bladder may occur and thus greatly lessen the chances for recovery. In the authors' opinion the treatment of choice is cholecystectomy.

G. E. BEILBY.

Giffin, H. Z.: Tuberculosis of the Spleen. *Med. Clin. N. Am.*, 1919, iii, 765.

The history and the findings in a case of primary tuberculosis of the spleen presented in this article seemed to indicate that this disease may produce an anæmia of the hæmolytic type and that splenectomy may result in a complete cure.

The patient was a girl, aged 16, who had complained of weakness, dyspnoea, pallor, and pain in the splenic region. Her history did not indicate the presence of primary tuberculosis. The blood picture was as follows: hæmoglobin, 50 per cent; erythrocytes 2,940,000; color index, 0.8; leucocytes, 6,800; polynuclear neutrophils, 71.7 per cent; small lymphocytes, 18.7 per cent; large lymphocytes, 7.3 per cent; eosinophiles, 2.3 per cent; basophiles, 0; normoblasts, 1; anisocytosis moderate; poikilocytosis slight; and polychromatophilia slight.

The duodenal contents showed a total of 6,000 units of urobilin and urobilinogen (modified Schneider method). There was no increased fragility of the red cells. Splenectomy was performed on March 15, 1916. The spleen weighed 508 gm. A tuberculous splenitis and perisplenitis were present. The tuberculosis seemed to be confined to the splenic area as the pelvic organs were normal. Rapid improvement followed the operation and the patient's general condition was very good three years and three months afterward.

Three other cases of tuberculosis of the spleen are reported to show the association of tuberculosis of the spleen with the clinical manifestations of hæmolytic jaundice, acute aplastic anæmia, and myelogenous leukæmia. In the case which simulated acute aplastic anæmia it is possible that the tuberculosis may have had some etiological relationship to the development of the anæmia. In the other two instances it was probably only coexistent.

From his review of the literature and his own experience the author concludes as follows:

1. Splenectomy is indicated in cases of more or less definitely localized tuberculosis of the spleen.

2. From the standpoint of diagnosis, tuberculous splenitis should be considered in every case of marked splenomegaly in which the findings are not clearly those of some other disease. Primary tuberculosis of the spleen may simulate pernicious anæmia. The coincident association of tuberculosis with diseases of the spleen and blood will explain a certain small percentage of atypical cases.

MISCELLANEOUS

Hazen, R.: Rational Surgery of Visceroptosis by the Correction of Malfusion. *J. Am. M. Ass.*, 1919, lxxiii, 1753.

The author reports 116 cases of visceroptosis which failed to respond in satisfactory degree to fattening and treatment with belts, posture, and calisthenics.

Under the term "malfusion" Hazen discusses the embryology of this condition and claims that the congenital type of visceroptosis was found in 96 per cent of the cases reported. Malfusion constitutes the fundamental pathology of visceroptosis. The prevailing operations of suspension, plication, colectomy, etc. are not universally accepted as they do not strike at the source. They do not correct the malfusion nor do they restore the static equilibrium of the abdominal viscera. Hypofusion or laxity of attachment permits prolapse of the colon which results in abnormalities in the position and relations of the viscera. In 89 per cent of this class of cases the hepatic flexure is ptosed and fixation of this structure, the chief purpose of operation, constitutes the key to the situation.

The hepatic flexure coming out from beneath the liver produces a vacancy in the upper abdomen. The liver rotates inward to occupy this space and the costal margins collapse. The inward rotation of the liver carries with it the pyloric end of the stomach which then assumes a position near the median line at a much lower level than before. This change constitutes a ptosis of the stomach with its axis nearly vertical.

Hyperfusions are localized adhesion formations usually having their origin in certain vestigial embryonic membranes. Fibrous hypertrophy, and later contraction, may occur as a result of the intermittent traction of a loose segment of the bowel. These formations will then produce constrictions and angulations of the colon and traction strains at both ends of their attachment.

Rational surgery is a constructive procedure as the patient with ptosis is virtually rebuilt after the pattern of the normal. The principles involved are primarily the replacement and retention of the colon by fusion produced at the back of the bowel where it should have occurred originally.

The abdomen having been opened in the median line, the colon is lifted out and palpated from the cæcum, particular attention being given to its at-

tachments in the renal, hepatic, pyloric, and splenic regions. All adhesive glands are divided.

The mesocolon is plicated, the plication being begun at the cæcum. The sutures are introduced into the bowel wall and deep bites are taken in the iliac and lumbar fascia of the wall of the flank. The capsule of the kidney is included in the stitch coming from the beginning of the hepatic flexure. These sutures are tightened and the bowel is drawn and firmly and evenly attached to the flank in its normal position.

In order to insure an easy forward and inward curve to the hepatic flexure, a suture is inserted in the edge of the gastrocolic omentum and then in the lateral abdominal wall just beneath the liver.

Any slackness in the transverse colon is taken up either by plication of its mesocolon or suspension by the hammock operation of Coffee.

If the transverse colon is much elongated and there is obliteration of its sacculations, fine silk sutures may be inserted at intervals in the longitudinal muscle band in such a manner that when they are tied this band will be shortened 2 in. with each stitch and the sacculations will be re-formed.

Ptois of the kidney may be repaired by taking a deep suture backward through the peritoneum close to the inner side of the lower pole of the kidney and down to and including the lumbar fascia, then coming outward and forward close to the outer side of the lower pole and emerging from the peritoneum. When this suture is tied, the opening in the capsule of the kidney is obliterated. The kidney is replaced before the suture is tied and the strands of the nephrocolic ligament of Longyear are secured to the lumbar fascia.

H. A. McKNIGHT.

Deaver, J. B.: The Acute Abdomen. *Surg., Gynec. & Obst.*, 1920, xxx, 30.

The majority of acute abdominal conditions are the result of antecedent chronic disease, and if this chronic disease had been recognized and properly treated it is probable that the acute attack would have been avoided. Such treatment would therefore help to reduce the incidence of the acute abdomen and in large measure would decrease the unnecessarily high mortality.

Untimely and unsuitable operations are also responsible for many fatalities in acute abdominal disease. Prominent among such operations are those done for acute postoperative gastric dilatation, acute gastro-enteritis simulating appendicitis, pneumonia, diaphragmatic pleurisy with rigidity of the upper abdomen and referred abdominal pain, and the gastric crises of tabes.

On the whole, however, the greater toll of lives is exacted by delay in the operative treatment. This can be remedied primarily by diagnosing the condition promptly. During the period between the onset of the attack and the operation it is important to avoid the pernicious practice of administering purgatives and morphia. Propaganda against these procedures is the duty of the profession.

The proper time to operate depends upon experience in similar cases and the proper interpretation of the history of the case and the clinical examination. While in obstructive conditions with evidence of hæmorrhage into the abdominal cavity and perforation into the peritoneal cavity delay is inadvisable and futile, in acute inflammatory conditions involving the peritoneum the nicest discrimination is required. If the case is seen early, the peritonitis can be prevented only by prompt operation, but if the peritonitis is established and diffused, especially in the successfully (?) purged case, there are few, if any, surgeons who can operate with success.

The type of peritonitis depends on the virulence of the exciting organism, the duration of the attack, and the patient's resistance. In early perforation it is mild and later becomes circumscribed. In non-perforative conditions of the upper as well as of the lower abdomen, it is at first circumscribed and later diffuse. Diffuse peritonitis demands primarily physiological and anatomical rest. In cases of circumscribing, circumscribed, or localized peritonitis in which the origin of the peritoneal inflammation is known, operation with the proper technique is comparatively safe, especially if free use is made of gauze pads and large gauze sponges for the protection of the surrounding peritoneum.

In considering the advisability of operation it is well to remember that all perforative inflammations tend to generalize. Appendiceal, cholecystic, and pelvic inflammations, on the other hand, have a strong tendency to localize, and generalization in these cases is usually the result of improper treatment.

The use of laboratory methods often so valuable in arriving at a diagnosis in chronic disease of the abdomen is not always either feasible or applicable in acute disease. The exception is probably the blood count, that is, the complete count, but even this is not reliable in every case. That increased leucocytosis does not always indicate the presence of pus has often been proved at the operating table, and therefore the blood count is useful as an aid to, but not as a substitute for, clinical experience. To the experienced surgeon a more reliable indication is the elicitation of exquisite tenderness to the touch at or near the site of the lesion.

Monsarrat, K. W.: Remarks on Some Clinical Types of Tuberculosis. *Brit. M. J.*, 1920, i, 5.

Tuberculous peritonitis associated with massive exudation is favorably influenced by simple evacuation of the fluid. At the same time if the primary focus of the visceral disease is found, it may be removed. It is probable that in most cases the widespread exudative type of peritoneal infection is primarily a blood-borne serous infection.

The lower end of the ileum is probably the commonest site of tuberculous disease of the alimentary tract. Necrosis and ulceration of the mucous membrane are followed later by local tuberculous peri-

tonitis resulting in a matting together of the bowel surfaces which may be revealed first by obstruction. Acute perforation is rare. This type the author considers as localized.

The next most common site of bowel tuberculosis is the cæcum. The cæcal wall becomes thickened and infiltrated, stenosis results, and massive tumors are formed. The author believes this form of the disease may occur also in the sigmoid.

The mesenteric glands may develop tuberculous disease. The condition may be widespread or local. A favorite site is the mesenteric angle between the cæcum and the ileum. The symptoms of this form suggest chronic appendicitis—sharp darting abdominal pain at long intervals associated with definite and localized tenderness about the cæcum.

The conclusions drawn with regard to surgical treatment are as follows:

1. When tuberculous disease, either of the ileum or the large bowel, is associated with definite intestinal obstruction, operation is always necessary, and the choice lies between exclusion by anastomosis and excision. If the obstruction is acute, exclusion by anastomosis is to be preferred; if the obstruction is subacute, the exact local condition must decide. When the mass is easily isolated it is best to remove it.

2. When such tuberculous bowel lesions are not associated with obstruction or when the obstruc-

tion is chronic and may be relieved by an aperient, the advisability of operation will depend upon whether the bowel disease is or is not the sole demonstrable lesion in the body. If the lung also is affected it will probably be wiser to decide against operation.

3. In disease of the rectum it is not probable that a remedy is to be found in the establishment of an artificial anus. This has been recommended and practised on the ground that keeping the rectum empty affords a better prospect of resistance and recovery. In one instance, however, this procedure added to the patient's discomfort without obviously benefiting the rectal condition. Before recommending this method of treatment we should require evidence that cure of the rectal disease can really be anticipated in a fair proportion of cases. When the rectum is affected above the peritoneal reflection and there is abscess, evacuation of the abscess by the intraperitoneal route is to be recommended. Except for the treatment of this complication, however, operation has no service to offer.

4. In selected cases operation gives good results in limited tuberculous disease of the mesenteric glands. According to the extent and the stage of the disease focus the surgical treatment will take the form of enucleation or of excision of the mesentery involved and the associated bowel.

J. A. H. MAGOUN, JR

SURGERY OF THE EXTREMITIES

DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Tassone, U.: Bone Complications Due to the Eberth Bacillus Following Typhoid (Complicanze ossee post-tifiche da bacillo de Eberth). *Policlino*, Roma, 1919, xxvi, sez. chir., 273.

The Eberth bacillus may invade not only the intestine, lung, brain, and other organs, but even tissues which because of their resistance and their distance from the focus of infection, might be considered immune. In 90 cases of bone suppuration Lannellongue found the Eberth bacillus in 4.

Age is a factor in infections following typhoid. While the maximum frequency of other similar infections is reached between the twentieth and thirtieth years, bone complications are more frequent between the ages of eleven and twenty. Some attribute this fact to a state of functional hyperactivity in early life. Traumatism during convalescence may also be a factor of some importance.

According to the intensity of the process, bone complications following typhoid fever may be divided into four classes: (1) those characterized by rheumatoid pains and spontaneous resolution; (2) acute osteoperiostitis giving rise to general and local phenomena (severe cases may end in osteo-

myelitis and necrosis); (3) a chronic suppurative condition; and (4) a chronic non-suppurative condition with a tendency to the formation of exostoses.

The first type is not serious, and after incision and evacuation of the pus the acute suppurative type also has a good prognosis. In the chronic suppurative form the prognosis is doubtful, while in the chronic type characterized by the formation of exostoses it is grave as often the whole limb or both limbs are involved and there may be atrophy of the muscles with deformity.

The author reports the case of a man 23 years of age who, about two months after an attack of typhoid, had sharp pains all over his body. Gradually these pains concentrated in the left foot which became swollen. A large quantity of pus was evacuated by an incision made behind the left tibial malleolus. The swelling spread to the whole leg and knee, however, and a month later another large quantity of pus was drained from an opening in the malleolar region. After several months the condition resulted in immobilization of the knee and some atrophy of the muscles of the thigh. Recovery followed an operation in which the bone exostoses were removed. The Eberth bacillus was discovered constantly and repeatedly in the pus and cultures.

W. A. BRENNAN.

Bland-Sutton, J., and others: Discussion on Secondary Deposits in Bone Mistaken for Primary Tumors. *Proc. Roy. Soc. Med., Lond.*, 1919, xiii, Sect. Surg., 1.

In discussing the subject of secondary deposits in bone mistaken for primary tumors before the Royal Society of Medicine, London, Bland-Sutton called attention to the fact that a secondary carcinoma growing in an organ not easily accessible to putrefactive micro-organisms may become very large before attracting attention. This phenomenon has been observed particularly in connection with the ovary. Large solid and semisolid ovarian tumors have been removed under the impression that they were primary. The histology of such tumors has proved that the primary tumors arose in the breast, gall-bladder, or gastro-intestinal tract, and the subsequent history of such patients has confirmed the histologic findings. The same is true of bones. Portions of long bones have been removed and limbs have been amputated for tumors regarded as primary, but histologic examination showed that the tumor-tissue contained epithelial elements and it has been established that epithelial tumors do not arise primarily in bone.

In recent years some remarkable bone tumors have been removed from bones which, when examined, were found to resemble the zona fasciculata of the adrenal. Subsequently a tumor of similar structure was found in the kidney or adrenal.

The purpose of this discussion was to collect evidence concerning these tumors. Bland-Sutton reported the case of a doctor, aged 45, who had a swelling in the lower part of the right humerus. Clinically it resembled a myeloma and was excised in the belief that it was a myeloma. Two years later it recurred in the stump of the bone and was again excised with 2 in. of the humeral shaft. The patient remained well for five years and then died suddenly. At autopsy a tumor was found in each adrenal and in the right kidney. The tumors in the humerus, in the adrenals, and in the kidney were so destroyed by extravasation of blood that the structure of the growths could not be satisfactorily determined, but a solid secondary nodule in the heart, the shape and size of a nut, showed the characteristic structure of the zona fasciculata of the adrenal. The author regarded this as an example of the dissemination of an adrenal tumor, but Dunn who examined the specimens believed that the primary tumor arose in the kidney and was a hypernephroma.

The case illustrates that cancer *per se* is an extremely chronic disease until it becomes septic; then misery attends until life is extinguished by a terminal infection.

Low reported the case of man, aged 55, who was admitted to the hospital December 11, 1913, for a lump on the right clavicle. Eight weeks before admission he "ricked" his shoulder while practicing physical exercises. In order to ease the slight pain which followed he rubbed the shoulder with liniment, and it was while so doing about a fortnight

after the accident that he first noticed the lump. The lump was not painful and caused little inconvenience. There was a hard, somewhat lobulated swelling on the right clavicle at the juncture of the outer and middle third. It was not attached to the skin and appeared to embrace the shaft of the bone. X-ray examination showed that there had been a fracture and that the broken ends of the bone, which slightly overlapped, were enveloped in a mass of "growth." Although a Wassermann reaction was negative, antisiphilis treatment was adopted for a short time and at first seemed to be of some benefit.

On January 6, 1914, the tumor was exposed and found to be a definite bony swelling of the clavicle. There was no evidence of a growth on the surface. When the compact tissue was cut through a cavity containing yellowish material, not at all unlike what would be expected in a gumma, was exposed. This was contained in a smooth-walled cavity in the bone from which, however, the bleeding was profuse and could be stopped only by filling the entire cavity with wax. On section the growth proved to be a carcinoma. As there was no definite evidence of a primary growth, the clavicle was removed. The patient made an uneventful recovery. Death occurred three or four years later, but the author was unable to learn the particulars.

Nitch reported two cases which are examples of errors in diagnosis resulting from the absence of symptoms which would have led to a recognition of the primary growth.

The first patient was a man, aged 52, with a swelling of two years' duration below the right elbow. This caused severe pain and rapidly increased in size. Immediately below the olecranon process was a soft, fluctuating, fusiform swelling, 3 in. long and 2 in. wide, involving the upper third of the ulna and invading the elbow joint. X-ray examination showed destruction of the coronoid process and practically the whole of the upper third of the ulna, only a thin shell of bone being left over the back of the tumor.

When an incision was made into the swelling it was found to be a soft, highly vascular, plum-colored growth studded with sulphur-colored nodules. Above, it was encapsulated, but below, it infiltrated the muscles. It was widely excised. The microscopic sections were described as typical of carcinoma of the adrenal cortex. The abdomen was then examined and a nodular tumor found in the right loin. Shortly after the operation a soft pulsating nodule was discovered in the ninth rib. The growth in the arm recurred. Until three weeks before this report was made, when the patient had a severe attack of hæmaturia, there had been no symptoms suggestive of the location of the primary growth.

The second case was that of a female with a large globular swelling of the upper end of the right humerus and another in the body of the left scapula. These were thought to be sarcomata and their real

nature was not recognized until after microscopic examination of a portion of the tumor removed for the purpose. It was then discovered that the growths were secondary to an adrenal carcinoma which up to that time had given no signs of its presence.

Nicholson reported the case of a girl, aged 19, who was operated upon for a soft central tumor of the lower end of the tibia. On microscopic examination it presented the typical structure of an embryonic tumor of the kidney. No abdominal neoplasm could be palpated. Two years later the patient was re-admitted for a recurrence in the tibia and at this time a tumor was palpable in the left kidney region. It was thought to be a renal growth. No further operation was performed and the patient was not seen again.

According to Rolleston, a squamous-cell carcinoma rarely produces metastases at a distance. He reported two cases of curious metastases:

A man found dead in the street had a nodule of squamous-cell carcinoma in the apex of the heart; there was no other growth in the body, but the penis had been amputated presumably because of a squamous-cell carcinoma.

The second case was that of a man whose right arm had been amputated for recurrent squamous-cell carcinoma. Both layers of the pleura on the right side were infiltrated with secondary growths and enclosed a cavity containing blood-stained fluid.

The author is interested in the relative tendency of malignant growths of the adrenals and of the so-called renal hypernephromata (the adrenal origin of which is now much in doubt) to produce bony metastases. It is noteworthy that the so-called renal hypernephromata are not associated with the abnormal sex characters seen in cases of tumors arising from the adrenal cortex, and it would be interesting to know if there is any corresponding difference as regards bony metastases.

Rowntree reported the case of a boy who was knocked down by a motor car, sustaining an injury to his head. Shortly afterward a tumor of the frontal bone developed and death resulted. The autopsy revealed the presence of a malignant growth in the sigmoid with numerous secondary deposits, including a deposit in the frontal bone, all of identical histologic character. The coroner found that the mass on the head was secondary to a primary growth in the sigmoid and returned a verdict of death from natural causes.

G. W. HOCHREIN.

Evans, W. A.: Multiple Myeloma of Bones. *Am. J. Roentgenol.*, 1919, n. s. vi, 646.

Three cases of multiple myeloma of bones are described in detail. In the first, in which the roentgen examination was confined to the pelvic structures, the plates showed a malignant new-growth of bone origin, and according to the pathologic report the tumor was a myeloma of the plasma-

cell type. In the second case the growth involved the upper end of the humerus, the clavicle, the scapula and the ribs. In the third, the roentgen examination demonstrated wide-spread bone lesions and the condition was diagnosed as carcinomatosis. An autopsy in the last two cases showed that the lesions were confined to the osseous system and that the tumors were soft in consistency and of various sizes. On section, it was found that the new-growth had replaced the marrow, and in many places had broken through the cortex, appearing externally as nodules. There was almost complete absence of calcium.

The etiologic factor in the condition has not been determined. One author suggested trauma as the cause, but presented nothing to support his view. Others believe it to be the indirect sequel of an infectious process, while still others maintain that it is due to nutritional disorders.

In the three cases here reported the symptoms were similar. There were pains in the chest, back, groin, and thigh, and increasing weakness and progressive loss of weight. The disease extended over a period varying from six months to two years and was always fatal.

W. A. EVANS.

Moore, A. B.: A Roentgenologic Study of Metastatic Malignancy of the Bones. *Am. J. Roentgenol.*, 1919, n. s. vi, 589.

In this paper the author gives a summary of 65 cases of secondary carcinomatous involvement of the osseous system, and emphasizes the necessity, as urged by Pfahler in 1916, for complete and thorough X-ray examination in all cases of known or suspected malignancy in which there is any suspicion of the presence of secondary osseous involvement.

Two types of bone metastases are described, the osteoclastic, which is the more common manifestation of breast malignancy, and the osteoplastic, which is more common in cases of carcinoma of the prostate. The osteoclastic form is characterized in the roentgenogram by an extreme decrease in density, the bone having a typical honey-comb appearance. The osteoplastic form shows in the roentgenogram as an irregular increase in bone density, the bones having a chalky appearance without cortical or periosteal thickening.

In Moore's series the most common sources of bone metastases were the breast, the prostate, and the kidney. His statistics differ from those quoted in the literature in which carcinoma of the thyroid was second only to carcinoma of the breast as a source of bone metastasis.

The most common site of bone metastases is in the spine, and any vertebra from the atlas to the sacrum may be involved, although the greater percentage of secondary growths occur in the lumbar portion.

The following conclusions are drawn:

1. Bone metastases may result from malignancy of almost any organ, but the most common foci are the breast and prostate.

2. Bone metastases are uncommon in malignancy of the thyroid.

3. Bone and pulmonary metastases are rarely associated.

4. The most common symptom complained of is pain. This is fairly typical and should be regarded as an indication for a roentgen examination.

5. The roentgen appearance is characteristic. Therefore a thorough examination by the X-ray should be made in all cases in which there is any suspicion of bone metastasis. W. A. EVANS.

Green, T. M.: Elephantiasis and the Kondoleon Operation. *Ann. Surg.*, 1920, lxxi, 28.

The author reports his successful use of a modified Kondoleon operation in a case of elephantiasis. The technique was as follows:

Two incisions were made from the trochanter major to the external malleolus by Kondoleon's method as modified by Sistrunk. The incisions began at the trochanter and diverged in the thigh until they were 10 cm. apart and then approached each other again until at the lateral aspect of the knee they were 6 cm. apart. They then diverged until they were 10 cm. apart at the center of the foreleg from which point they again gradually converged to meet at the malleolus. The subcutaneous tissues at the edges of the skin incisions were under-cut for a distance of 4 cm. and the skin flaps held back.

A strip of fascia lata about 6 cm. in width was removed throughout the entire length of the incision and this mass, consisting of skin, subcutaneous tissue, and fascia lata was taken out *en bloc*. In Kondoleon's original operation no skin was removed. Sistrunk has shown, however, that the excision of an amount of skin equal to the amount of fascia removed prevents redundancy of the skin. After hæmostasis was effected the skin edges were approximated and sutured. A smaller but similar flap was then removed from the inner aspect of the limb from the trochanter minor to the internal malleolus. The gross weight of the tissue excised was 6 lbs.

Following the operation the limb was bandaged daily with an elastic bandage before the patient arose.

The change in the appearance of the limb within a week was astonishing. In the portion not reached by the incision the oedema lost its hard brawny feeling at once and came to resemble that of an ordinary varicose limb. After the first week the leg rapidly resumed its normal aspect.

H. A. MCKNIGHT.

Morley, J.: Traumatic Myositis Ossificans from Gunshot Wounds. *Brit. J. Surg.*, 1919, vii, 178.

Traumatic myositis ossificans is the growth of bone in contused muscle. It follows a single severe trauma, usually without a break of the skin or fracture of the bone.

In the cases reported in this paper the condition followed gunshot wounds. In the author's opinion this fact is of value as evidence of the true nature of the process. All the cases were cases of shell wounds of the thigh with extensive laceration of the muscles and superficial injury to the shaft of the femur. A tumor developed in the quadriceps muscle which from four to six months later presented the typical X-ray picture of myositis ossificans. In one case the tumor was removed with good results, and in another case it was found four months later that the bony mass was almost entirely resorbed.

The author's findings seemed to confirm the results he obtained in experiments on rabbits in 1910. When the periosteum was removed from the bone without injury to the adjacent muscle the muscle became adherent and limited the amount of bony growth. When the muscle was traumatized, intramuscular ossification took place. The author bases his explanation of the increase of bone production upon these facts rather than upon the old theory of metaplasia. He advances the theory that by the grazing of the bone the periosteum is removed and the cortex opened, and as a consequence there is an outpouring of osteoblasts from the haversian canals. The trauma to the muscles and the resultant loss of power to limit the wandering of the osteoblasts then allows a greater production of callus.

The condition is therefore due, not to hyperactivity of the osteoblasts, but to the removal of the natural barriers. It is essentially the same as callus formation and is dependent on Wolff's law.

In suitable cases, excision with autogenous grafting of fascia to the shaft restores motion and prevents recurrence of the overgrowth of bone following a grazing gunshot wound. J. I. MITCHELL.

Morris, D. H.: The Deeper Structural Changes Arising from Varicose Ulceration. *Surg., Gynec. & Obst.*, 1920, xxx, 72.

Fundamental changes in structures remote from varicose ulcers are not generally recognized though these changes are quite regularly present when the ulceration is of long duration and are so striking and significant as to deserve emphasis. The tibia or fibula, and usually both, are involved in a diffuse periosteitis and osteomyelitis extending throughout the entire shaft and involving even the epiphysis. Associated with these processes are widespread vascular changes; the deep vessels, posterior tibial and peroneal, show marked calcification which extends to, or above, the popliteal. This sclerosis is not dependent upon the site, size, or depth of the ulcer, and is most marked when the ulceration has been present for a very long time.

The arteriosclerosis of the tibial and peroneal vessels suggests that the distribution of the bacteria to remote parts of the bone occurs through the arterial wall and the adjacent lymphatics. The micro-organisms may penetrate the walls of the nutrient vessels and thus become distributed to all

parts of the bones. In some cases, also, a retrograde lymphatic infection against the normal lymphatic current may take place. Either process seems reasonable and probably both occur.

In a large series of cases of varicose ulcers examined the changes were the same, differing merely in degree. They were always more marked in the leg which showed the worst varicosities or the most prolonged ulceration, and were regularly absent in the opposite extremity if this was free from varicose veins. Discoverable constitutional diseases were ruled out.

The article includes brief reports of 14 cases.

C. R. STEINKE.

Rich, E. A.: Septic Bone Infection, with Special Attention to Osteogenesis in Sepsis. *North-west Med.*, 1920, xix, 1.

The vascular and osteogenetic structures of bone—the periosteum and more especially the cancellous bone with its endosteum—are the all important structures that must be conserved in both acute and chronic types of bone infection to insure rapid repair. The old theory that regeneration of bone depends on the periosteum has been shown to be false. Osteogenesis is due to the bone cells underlying the periosteum which obtain their blood supply from the periosteal vessels and to the endosteal cells which receive nourishment from the vessels in the bone marrow.

All repair in bone is the result of osteoblastic action which in turn is dependent on the abundance of the blood supply. Therefore the factor of importance in such repair is the maintenance of the blood supply.

Mild infection is frequently a stimulus to bone formation and because of this fact injections of irritants and cultures of staphylococci have been used in the treatment of non-union.

In cases in which transplanting of bone has been done the transplants do not regenerate bone but are replaced by the osteoblastic action of the patient's bone cells. The repaired bone is always denser than the original bone.

Applying the facts mentioned to the treatment of acute and chronic bone infections, the author handles his cases as follows:

In acute cases the shaft is opened as wide as the medullary cavity for four-fifths of its length. The medullary cavity is then irrigated with sterile water and the wound is left open. It is not curetted as this would destroy the cancellous cells and endosteum which must be preserved to favor regeneration. No dressings are applied. The wound is irrigated daily with sterile water. By this treatment complete regeneration is usually obtained in three or four weeks.

In chronic osteomyelitis the medullary canal is laid open, the sequestrum is removed, and the cavity is obliterated by flaps of the surrounding muscles and fat with attached pedicles.

I. E. BISHKOW.

Williams, T. A.: A Variety of Post-Traumatic Contracture of a Limb Not Due to Direct Lesion of Muscle, Nerve, or Connective Tissue. *Internat. J. Surg.*, 1919, xxxii, 329.

Contracture was a condition frequently observed during the war. Generally it was hysterical, but as in many cases it did not seem to be amenable to suggestion or re-education, an explanation was sought with reference to the injury. In cases in which pain and pricking along the nerve trunks, atrophy of the muscles, and disturbed sensibility in the region supplied were present, Tinel attributed the condition to ascending neuritis. Freezing of a part may result in neuritis which in turn may lead to contracture because of the pain and tenderness. Tinel, however, was unable to explain the fact that in some cases the contractures recurred during convalescence, that they might disappear although the neuritic and trophic disturbances persisted, and that they occurred in inert or recalcitrant patients.

Babinski and Froment, arguing from the fact that atrophy at a distance may follow lesions of the joints when there is no evidence of neuritis, claim that Tinel's explanation is unsatisfactory. Vincent also quotes striking cases in which atrophy of this kind persisted in the absence of any nerve lesion. One of Vincent's cases is reported in full. In such instances the condition may lead to a faulty attitude, the temperature of the part affected and the arterial oscillations are decreased, the mechanical response of the muscles is increased, the reflexes and the reaction to electrical stimuli are changed, and motor incapacities develop.

The pathogenesis of the phenomena is regarded by Babinski as vasoconstriction. He believes that the condition is induced reflexly by the irritation of the wounded part, even when it occurs at a distance from the region involved. Incapacity is never complete from this cause alone, however, for the patient nearly always adds to it by inertia, showing no will to make the efforts required to compensate for the very moderate physical disability. This is evident from the fact that in nearly all cases efficient psychotherapy effects complete restoration even when some atrophy persists and there is a lowering of the temperature on exposure to cold.

Jones, F. W.: The Anatomy of Snapping Hip. *J. Orthop. Surg.*, 1920, ii, 1.

In the two cases reported in this brief paper the snap of the hip was produced by rotation of the joint while the affected leg was bearing weight. It occurred also on extreme passive rotation, either external or internal, but on the operating table it was impossible to produce it by manipulation and no structure could be found to account for it. When the gluteus maximus was stimulated electrically, however, the snap occurred every time the trochanter was rotated back and forth beneath it.

On dividing the fascial insertion of this muscle and reflecting it back, it was found that the tendon which inserts into the gluteal ridge of the femur

was of unusual thickness and the snap was due to the slipping of the trochanter under it. On comparing these findings with dissections on the cadaver it was discovered that though the gluteus maximus may have only a small insertion on the shaft of the femur, in some cases there may be a well-developed sickle-shaped tendon springing from its deep surface and inserting down on the shaft. At operation in the cases reported this sickle tendon, which was of unusual development, was sutured to the great trochanter along its entire length. The snapping did not recur. It is suggested that the tendon is atavistic from the point of view of phylogenesis and that its importance is waning as the fascial insertion becomes more important.

On examining a number of normal persons several were found who could produce the snap of the hip at will and the author suspects that the two patients operated upon were exploiting the condition to obtain military exemption.

W. A. CLARK.

Cotton, A., and McCleary, S.: Myxoma of Bone, with Report of a Case of Myxochondrosarcoma of the Femur. *Am. J. Roentgenol.*, 1919, n. s. vi, 594.

True myxoma of the bone is seen so rarely that the question as to whether or not it is an entity has caused much discussion among surgical pathologists. A careful detailed search of the literature in 1918 failed to reveal any cases of pure myxoma of bone, although several of myxochondroma and myxosarcoma were found.

In comparing the clinical history of the case reported by Cotton and McCleary in 1917 with the case reported in this article, the following points of resemblance were noted: slow onset; obscure symptoms; predominating symptom pain resembling sciatica; difficulty in making a diagnosis; later great destruction of bone with enlargement of the thigh and loss of function of the limb; and final recurrence with malignancy.

A comparison of the points of resemblance in the X-ray examination of the two cases showed that both tumors originated in the medullary cavity, were attended by enlargement of the medullary cavity and expansion of the cortex, and later broke through the cortex and periosteum and invaded the muscles. In both cases also the outline of the cortex was irregular and there were cystic areas in the soft tissues due to the fact that the tumor mass pushed out the muscles.

In the second case, however, the X-ray examination was made at an earlier stage than in the first case and before an exploratory operation was done. In the second case also there was less thinning of the cortex and periosteal bone formation. The tumor extended from the great trochanter only to the middle of the shaft of the femur. Below the middle, the femur was normal in appearance. There was no new bone formation in the muscles where the cystic areas were found.

In the first case the pathologic report showed pure myxomatous tissue with evidence of processes of repair and of bone absorption. In the second case the tumor was reported as a myxochondroma at the first pathologic examination and the diagnosis of myxochondrosarcoma was not made until after amputation.

Pathologists are not in agreement regarding the myxoma. Some believe the condition is purely a degeneration of some other form of tumor, either benign or malignant. Others recognize it as a benign tumor which may remain benign or become malignant. From the history of two cases here reported, however, it is evident that the growth has a marked tendency to malignant degeneration.

Treatment of the condition is discussed at length. The authors believe that the only proper measure is amputation. This must be done early and well above the tumor tissue.

W. A. EVANS.

Dunn, N.: Calcaneocavus and Its Treatment. *J. Orthop. Surg.*, 1919, i, 711.

In a typical case of calcaneocavus the long arch of the foot is high as the front part of the os calcis is tilted upward and forward and the front of the foot is dropped on the mediotarsal joint. The weight of the body passes almost entirely through the posterior astragalocalcaneal facet to the point of the heel. The heel thus becomes merely a peg and the fore-part of the foot a useless appendage. The condition results from paralysis of the Achilles and subsequent contractures of the tibialis anticus and posticus which pull up the arch, and contracture of the extensors and peroneals which pull the pillars of the arch together.

Any disturbance of the relation between the astragalus and the os calcis is usually remedied by subastragaloid arthrodesis which renders the astragalus and os calcis practically one bone and counteracts the effects of the body weight on the weakened muscles and ligaments. This operation with displacement of the foot backward as done by Davis increases the stability of the foot and gives good results in mild or moderately severe cases.

Astragalectomy also gives a stable foot but has a disadvantage in that it shortens the leg from $\frac{1}{2}$ to $\frac{3}{4}$ in. and if the Achilles recovers strength later, the resulting fibrous ankylosis prevents a useful range of motion. Therefore this operation should be reserved for cases in which the posterior tibials as well as the Achilles are paralyzed.

The double-wedge operation of Jones consists in removing a wedge from the tarsus through a dorsal incision to correct the cavus and four weeks later removing another wedge from the back of the astragalus to correct the calcaneus deformity.

The author's treatment varies according to the severity of the case. The different types of cases and operations are given as follows:

Type 1. Weak Achilles, no deformity. The foot is fixed in equinus for from three to six months, this being followed by the application of a brace to

prevent dorsiflexion beyond a right angle and raising of the heel of the shoe $\frac{1}{2}$ in.

Type 2. Weak Achilles with more dropping of the heel than in Type 1 and some cavus deformity. In these cases subastragaloid arthrodesis is followed by postural treatment as in Type 1.

Type 3. No power in Achilles but posterior tibials active, moderate cavus, and contracture of plantar fascia. Treatment: Plantar fasciotomy, subastragaloid arthrodesis, and transplantation of the flexor longus hallucis, flexor longus digitorum, and peroneus longus to the posterior surface of the os calcis followed by fixation of the foot in equinus for ten weeks and after-treatment as in Type 1.

Type 4. No power in Achilles, tibial muscles strong, extreme cavus which cannot be corrected by manipulation. This yields to treatment better than the milder types because the greater the deformity the more satisfactory the results. Following plantar fasciotomy the cavus curve is stretched as much as possible. A wedge-shaped osteotomy is then done on the dorsum of the foot and most of the scaphoid, the astragaloscaphoid, and calcaneocuboid articulations are removed in the wedge. Following this, the tendons of the posterior tibial and peroneals are exposed through an incision posterior to the ankle and are divided as far forward as possible. A wedge with its base backward is then removed from the astragalus and the os calcis. The foot is now in three sections: the upper consisting of the astragalus; the lower, of the os calcis; and the anterior portion made up of the part anterior to the scaphoid. The Achilles is split into an anterior and posterior layer and a hole drilled through the os calcis downward between these two layers. Through this drill-hole the severed tendons of the flexor longus hallucis and digitorum, the tibialis posticus, and the peroneals are drawn with chromic gut. The catgut is carried clear through the skin under the os calcis and tied over a small gauze pad, the foot being placed in equinus. By this means the tendons are held down securely until they become adherent. They are also sutured between the two layers of the Achilles. The correction of the cavus deformity is maintained by a sole splint, and the whole foot is put in a cast in equinus for about eight weeks.

Type 5. No power in the Achilles, some in the anterior tibials, little or none in the posterior tibials. Treatment: Osteotomies as in Type 4. The tendons are not transplanted but the foot is displaced slightly backward in relation to the tibia.

All of these operations are done in one stage.

W. A. CLARK.

FRACTURES AND DISLOCATIONS

Kleinberg, S.: Dislocation of the Carpal Scaphoid and Semilunar Bones. *J. Am. M. Ass.*, 1920, lxxiv, 312.

Dislocation of the carpal bones is very rare, few cases being recorded in the literature. Many orthopedists have never seen a case. In this article

the author reports two cases in which he obtained a good functional result, in one by operative removal of the dislocated bones, and in the other by conservative treatment alone. The chief points of interest in these cases were as follows:

Case 1. A laborer, aged 21, injured his wrist in falling from a fifth story window. Voluntary motion was lost and a mass was palpable under the skin on the front of the wrist. The X-ray showed dislocation of the scaphoid and semilunar bones upward and forward to a position anterior to the radius and ulna. The two bones were removed by operation and the wrist then treated by baking, massage, manipulation, and exercises. The improvement has been continuous and ultimately normal function is expected.

Case 2. A man, 45 years of age, sustained an injury of the wrist when he was thrown from an automobile. The wrist swelled up and its action became greatly restricted. After the swelling had subsided, palpation revealed a lump on the front and a hollow in the middle of the back of the wrist, findings which are pathognomonic of dislocation of the carpal semilunar. As manipulative reduction under an anæsthetic was refused, the treatment consisted of baking, massage, gentle manipulation, and graduated exercises. Improvement has been slow but continuous, and at the present time the patient has almost perfect use of the hand and fingers though normal strength has not yet returned. The pain continued much longer than in the first case.

M. J. HOBART.

Jones, J. P.: Fractures of the Femur from the Orthopedic Point of View. *J. Orthop. Surg.*, 1920, n. s. ii, 13.

This paper is a report of a method used and originated by Pearson at one of the special "femur hospitals" in Great Britain the Edmonton Military Hospital, London.

The method consists in overhead suspension with direct extension by means of ice-tong calipers. The overhead suspension in a wire splint (Thomas or Hodgen) is the same as that which was generally used in all military hospitals during the war and with which most surgeons are already familiar. The value of the paper, however, lies in its detailed directions for the application of the calipers to the femur and the subsequent care of the case.

In the treatment efficient fixation with correct alignment and early movement of neighboring joints are of fundamental importance. The caliper direct extension method will permit early mobilization of the knee.

In applying calipers to the femur, apparently trivial details make a great deal of difference in the patient's subsequent comfort. The skin should be drawn upward and slightly forward over the condyles so that later it will not draw on the caliper points or over the patella. On the outer side the tong should not be placed through the iliotibial band but anterior to it so that in movements of the

knee the movable band will not be restrained by the calipers. Another error is placing the tongs too far to the front so that they slip on the sloping surface. On the external side the point of insertion is just proximal to the most prominent point of the outer condyle in front of the iliotibial band, and on the internal side, about a finger's breadth proximal to the adductor tubercle.

The caliper points are not driven into the spongy bone, but only into the hard cortex, and just enough to obtain a firm grasp. The skin is first incised over the point of application, being drawn upward and forward as described. The weight which furnishes extension to the bone produces pressure which makes the caliper pinch into the bone and holds the points in place. A screw adjustment in the handle keeps the points from going any deeper into the bone. The application of the calipers is done under gas. The wounds made by the insertion of the points are dressed with a narrow strip of flavine gauze.

After their insertion, the tongs are held in place until the weight is applied. The pull being direct, only 10 or 15 lbs. will be necessary to give sufficient extension. Counter pressure comes on the ischium against the ring of the Thomas splint, the lower end of the splint being fixed to an upright at the foot of the bed. Illustrations in the text indicate that the leg below the knee is swung in a branch from the main splint in a horizontal position. The ring of the splint is also suspended in order to hold it up against the ischium.

From the very beginning mobilization of the knee should be done daily by the surgeon himself. Later, when union has become firm, this may be carried on by the masseur. The mobilization is the principal advantage of the direct supercondylar extension method. Another advantage is that the pull of the caliper acts over a fulcrum at the knee joint and tends to correct the usual backward displacement of the lower fragment, especially in fractures in the lower third. In the average case the calipers are left on from five to seven weeks. In 205 cases the average shortening at the end of treatment was 0.48 cm.

W. A. CLARK.

Bergeret, A.: Verticotransverse Fractures of the Femoral Condyles (Fractures verticotransversales des condyles fémoraux). *Rev. de chir.*, Par., 1919, lvii, 592.

By a "verticotransverse" fracture of the condyles of the femur the author means a fracture the downward and forward disjunction plane of which approximates the vertical, is directed transversely, and almost corresponds to the plane formed by the floor of the intercondylar notch. It is clearly distinct from the usual monocondylar fracture the disjunction plane of which passes through the notch and has an anteroposterior direction.

The verticotransverse fracture is rare. The author reports a case and summarizes a few others from the literature. Clinically the patients show the

usual symptoms of fracture of the knee with hæmarthrosis which renders palpation and the discovery of the lesion difficult. Even prior to the development of the hæmarthrosis, however, it is extremely difficult to make a diagnosis from a clinical examination alone, but pain localized in a point corresponding to the posterior part of the condyle and shortening of the condyle may suggest the condition. When the fracture is associated with extensive capsular and ligamentary displacement the diagnosis is still more difficult.

Treatment by immobilization and then by mobilization and massage gives a poor result. Consolidation in an abnormal position with all its consequences is almost certain unless surgical measures are employed.

Bergeret suggests that an attempt at reduction and maintenance by osteosynthesis might be made. The method of choice is screw fixation, the screw being passed through the condyle from front to back.

W. A. BRENNAN.

Bowlby, A.: An Address on Gunshot Fracture of the Femur. *Brit. M. J.*, 1920, ii, 5.

The treatment of gunshot fractures of the femur in the recent war consisted of the treatment at the front and the treatment at the general hospitals. The use of the Thomas splint greatly simplified the care of such fractures, prevented further sepsis and laceration of the tissues, lessened bleeding, relieved pain, and thus allowed transportation without a marked increase of shock. Extension was made to the shoe or the "surgical spat" was applied. At the casualty clearing stations excision of damaged tissue, cleaning of the wound, and the re-application of the splint under gas and oxygen anaesthesia constituted the usual attention given. Primary amputation was necessary in a large proportion of cases because of: (1) complete crushing of a large area of bone; (2) extensive comminution of the lower articular end of the femur; (3) laceration of the femoral vessels; and (4) extensive destruction of the muscles or skin.

The treatment at the general hospitals attained greatest efficiency when selected and specialized organizations for the care of fractures were developed. Patients were operated upon on arrival unless too great shock was evident or unless the treatment given at the front had been sufficient.

The use of skeleton metal splints to allow traction downward and abduction or flexion was fundamental. The radiograph was frequently the best guide to the amount and direction of traction. Daily measuring and charting of shortening were found most valuable. Gaps between bone ends measuring 1 or 2 in. frequently filled with new bone. The traction used was continuous traction, the patient's body weight being countertraction to the weights and the foot of the bed being raised. Early movement of the knee and the application of a modified Thomas splint with calipers gave excellent results.

For fractures in the upper third and neck of the femur, Sinclair's hammock or Pearson's segmented mattress was used. Unless walking caliper extension splints were applied where callus and union were becoming firm, bowing was apt to occur when the patient was permitted to walk. Delayed primary suture was of great benefit, lessening pyrexia and stimulating rapid union with less late necrosis of fragments and abscess formation. Thus it decreased the mortality and the number of amputations. The question as to the advisability of removing comminuted fragments was unsettled. Extensive removal gave more rapid healing but was often followed by non-union. Up to 1917 the results were unsatisfactory in a large percentage of cases, but subsequently the better care afforded in special fracture hospital in France, the use of metallic extension splints, etc. greatly improved them and saved many lives and limbs.

Of 3,141 patients treated for fracture of the femur at the front, 550 died (17.5 per cent). Of these, approximately 21 per cent were treated by amputation and of those so treated 33 per cent died. In from 20 to 30 per cent of the total number of 3,141 cases there were multiple wounds or other serious complications and the mortality was very much higher in this class than in the remaining 70 per cent.

During the year 1918, 5,025 cases were treated in the general hospitals at the bases in France. Five hundred and forty-seven of these patients died (10.8 per cent). Five hundred and thirteen of the 5,025 patients were treated by amputation (10.2 per cent), and the mortality in these cases was about 33 per cent.

Inquiry in England shows that the mortality in the special hospitals more recently established was very low, generally about 1 or 2 per cent. The reasons were, first, that in 1918 the majority of the cases were kept in France until union had occurred and the wounds had healed, and second, that even in times of stress the worst cases were always retained in the special hospitals in France. For the same reasons the amputations in England were few.

In discussing shortening, the author states that it is apparently easier to get length in limbs which have been damaged by shell fire than in those treated in civil practice in which the muscles are intact. Experience has shown also that shortening will not result unless there is extensive loss of bone.

In New Zealand the average shortening in 54 cases treated in 1916 was 1.345 in.; in 116 cases treated in 1917, 0.957 in.; and in 90 cases treated in 1918, 0.25 in. In two special British general hospitals in France in 1918 the average shortening in 334 cases was 0.2 in., and in 60 cases, 0.2 in. In 36 of the 60 cases there was no shortening. In a special hospital in England in 1918 there was no shortening in 39 of 68 cases treated and the average shortening in the remaining 39 cases was 0.5 in.

H. W. MEYERDING.

Wilson, W. E.: *The Treatment of Malunion in Fractures of the Femur*. *Lancet*, 1920, cxcviii, 139.

An introduction to this paper written by Sir Anthony Barclay covers the condition of English soldiers returned after treatment in Germany for fractures of the femur. The results were most unsatisfactory and the authors ascribe them to unscientific and vicious methods. Apparently traction was used rarely, little fixation was given until late, and finally resort was had to the use of casts with windows or to amputation. The malunion had resulted in from 2 to 7 in. of shortening, bad alignment, and impaired movement of the knee joint.

Briefly summarized the author's treatment of the malunion consisted of osteotomy along the line of union, the application of a Thomas splint, and extension by means of Sinclair's glue or the use of two screws through the tibia and fibula. Usually at the end of eight weeks a knee-flexing arm was attached to the splint to permit knee motion. In another month the caliper walking splint was applied and used until union was firm. In all cases of fracture of the upper third of the femur Sinclair's net-bed was used and massage and electrical stimulation were given.

Suppuration after osteotomy occurred in the greater number of cases even though healing had been complete in from two to ten months. The pus contained proteus and coliform types. Often, also, staphylococci and streptococci were present, producing a foul, thick, dirty yellow discharge with a faecal odor.

Drainage was provided in all instances. Although in such cases there may be a marked local reaction, there is little shock and after a few days the temperature subsides and the convalescence is good unless a pocket of pus or a sequestrum forms.

The causes of angulation are outlined briefly as follows:

1. Want of care in the first position. Mere plating of the femur and treatment without slight extension on the limb to keep the muscles occupied often leads to union of the bone in a bowed position. In fact, if the screws hold, the strong plate bends also.

2. The assumption of the third position too early or the discarding of the caliper too soon.

3. Walking when angulation is already present.

4. Frail union such as occurs when only half the broken surface of the femur throws out callus, when there is a loss of bone in a large gap made good by callus, when there is partial union only because of loss of fragments, and when end-to-end apposition is obtained with little visible and palpable callus.

5. Sepsis.

If discovered early, the angulation was corrected by refracture without open operation, by active or passive moulding, or later by osteotomy.

H. W. MEYERDING.

Whitman, R.: The Treatment of Central Luxation of the Femur. *Ann. Surg.*, 1920, lxxi, 62.

This paper is limited to the consideration of fractures of the base of the acetabulum with penetration of the femoral head uncomplicated by extensive fracture of the pelvis or injury of the pelvic contents.

The injury discussed is caused usually by direct force applied to the trochanter. The physical signs are loss of prominence of the trochanter and slight flexion, adduction, and shortening of the limb. There is a fair range of flexion and extension, but rotation is very limited and abduction is almost completely restricted. Tenderness and pain are felt when the limb is moved and the injury often passes as a contusion.

When weight-bearing is attempted pain is reflected down the inner and posterior aspects of the thigh. The persistence of pain, stiffness, and a limp usually leads to further investigation and the diagnosis is established by X-ray examination. The displacement, if reduced, usually recurs when the limb is placed in the normal position. Moreover, traction is not often effective in withdrawing the head from the pelvis.

The practical indication in the treatment is to assure a sufficient range of abduction. From the functional standpoint this is of far greater importance than the reduction of the dislocation, although the one is necessarily dependent upon the other. The abduction method used for fracture of the neck of the femur may be employed although the mechanism in the two cases is quite different.

Having been anesthetized, the patient is placed on a pelvic support provided with a perineal bar. The two extended limbs are supported by assistants who draw the patient firmly against the perineal bar. The sound limb is abducted to the normal limit to fix the pelvis. The other limb in the extended attitude and under manual traction is then gradually and forcibly abducted, if possible, to the normal limit. This should indicate the complete withdrawal of the head from the pelvis. In this attitude a plaster spica is applied extending from the line of the nipples to the knee.

The plaster spica must be retained for several months. Since displacement is impossible in the abducted attitude, locomotion may be permitted as soon as it does not increase the discomfort. After the support is removed the limb must be passively abducted to the full limit at frequent intervals until the patient has regained voluntary control of this movement.

Since the purpose of the treatment is to secure and retain a sufficient range of abduction for functional requirements, an osteotomy below the trochanter is indicated when the resistance is so great that the head cannot be withdrawn by natural leverage.

In recent cases the displacement should be easily reduced by the abduction method, while in cases of long standing the prospect of improved function would hardly justify the risk.

C. H. POOL.

Mowell, J. W.: Pott's Fractures. *Northwest Med.*, 1919, xviii, 265.

Pott's fracture is produced usually by some trauma or fall which forces the foot outward, tears the internal malleolus from the tibia by the internal lateral ligament, and in a typical case breaks the fibula from 1 to 3 in. above its tip, carrying the astragalus outward. The foot drops backward because the articulation is relaxed, and there is outward and backward dislocation.

The surgeon may reduce a Pott's fracture by placing his knee against the tibia, grasping and everting the foot so as to free the internal malleolus, pulling the foot forward, inverting it slightly, and completely dorsiflexing it on the leg. Plaster should then be applied down the leg from the popliteal space behind to 3 in. underneath and beyond the toes, the foot being in inversion and dorsiflexion. The after-treatment should consist essentially in raising the inner heel $\frac{3}{8}$ in. after the fracture has sufficiently healed.

The author presents diagrams of ankles in which the astragalus dislocation was not reduced because eversion was not done before the inverting and thus the fragment of the internal malleolus was driven up into the articular surface of the tibia. Ninety per cent of Pott's fractures do not show good functional results on this account.

R. G. PACKARD.

Estes, W. L., Jr.: A Study of the Cause of Delayed Union and Non-Union in Fractures of the Long Bones. *Ann. Surg.*, 1920, lxxi, 40.

Estes reviews the results obtained in the treatment of 374 fractures including fractures of the humerus, radius, ulna, femur, tibia, and fibula.

In discussions of the general causes of delayed union and non-union attention has been called to the fact that syphilis may be a factor even in the absence of a history and manifestations of the disease. A routine Wassermann would therefore seem indicated in all cases in which delayed union may be suspected.

In regard to the location of delayed and non-union in the cases analyzed the findings were fairly constant. In the humerus they both seemed to be confined to the middle third. In the radius and ulna, delayed union was more prone to occur in the distal half. In the ulna, non-union was more frequent in the upper third. In the femur non-union was more apt to occur in the neck, while in the shaft, delay in union was more frequent in the distal third. In the tibia, delayed union and non-union seemed distributed fairly equally over the entire shaft, but the tendency to delayed union was greater in the upper third and the tendency to non-union greater in the upper and lower thirds.

Fifty per cent of the cases of delayed union were due to compound comminuted fractures and a small number to the comminution alone. These figures substantiate the common belief that in cases of open wounds with a fresh fracture in

which there is more or less laceration of the soft tissues there is a marked tendency to delayed union. In every 10 cases of this kind among those analyzed delayed union occurred in 3 (10 per cent). When there is comminution, which usually is due to an extensive trauma or crushing, delayed union occurs in 3 out of every 4 cases and non-union in 1 out of every 8.

It is well known, however, that Blake's treatment of war fractures, which these compound comminuted fractures of civil life so closely resemble, tends to produce more rapid union and return of function, and it is gratifying to realize that as the problem presents itself there is now at hand a method which should improve the statistics. The small number of cases of delayed union in which plating is indicated may also be diminished by the more frequent application of balanced suspension.

Attention is called to a group of cases in which the cause for delayed union cannot be accurately determined and it is suggested that studies in metabolism may offer an explanation and suggest a rational therapeutics. H. A. McKNIGHT.

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Turner, G. G.: *The Uses of Free Transplants of the Fascia Lata in Surgery.* *Brit. M. J.*, 1920, i, 79.

Having had excellent results with fascia lata transplants in arthroplasty, the author recommends their use also in other operations. He has employed them successfully to protect sutured nerves and tendons against the inroads of sepsis and slowly forming granulation tissue. Fascia has been found to be surprisingly resistant to septic processes, remaining viable in cases of very severe infection.

The tendon or nerve to be repaired is covered by a piece of fascia lata which is fixed so that it extends beyond the area of damaged tissue. Thus used, the facial covering offers an effective barrier between the repaired tissues and the skin.

Turner has found pieces of fascia lata of value also to replace lost tendons. A section of sufficient length is cut, rolled into a thin cylinder, and then sutured in place so as to bridge the gap in the tendon. Transplants have been used also to cover the exposed brain when the membranes are deficient. In this connection reference is made to a case of Jacksonian epilepsy in which there was adherence of the brain tissue to the overlying skin flaps following a decompression for a gunshot wound of the head. Complete recovery followed the insertion of a fascial layer between the skin flaps and the brain tissue.

Another use of free transplants of fascia lata is as an aid in the repair of urethral fistulæ that do not yield to ordinary surgical procedures. When fixed between the mucous membrane and skin layers they re-inforce the stretched-out tissues and suture line.

The area from which the fascia is removed generally gives no trouble. The author has found it necessary to suture only when the transplant was a small one. A. J. SCHOLL.

Lavalle, C. R.: *The Treatment of Tuberculous Osteo-Arthritis by Bone Grafts* (Tratamiento de las osteo-artritis tuberculosas por injertos óseos). *An. d. Inst. mod. de clín. méd.*, 1919, iv, 8.

The surgical treatment advocated for tuberculous osteo-arthritis has become more and more conservative. First, the amputation of the diseased member above the lesion was done; then, the total resection of the diseased joint; and finally, resection of only the diseased portions of the joint or the bone. Today, all these procedures are discarded in the majority of cases and considered only when a fistula is present with great destruction of tissue, when the patient is cachectic, or when he is of an aboriginal race in which hereditary immunity is almost entirely lacking and cannot be depended upon to wall off the lesion.

Lavalle considers rest and heliotherapy the most efficacious therapeutic measures. Rest is obtained most satisfactorily by continuous extension which tends to keep down the congestion and aids in the resorption of the extravasated fluids in the oedematous tissues. Heliotherapy is useful as it stimulates phagocytosis and has a general tonic effect.

In the surgical treatment the author has found that success depends upon the following factors:

1. The use of autografts.
2. The most rigorous asepsis possible.
3. Careful preparation of the field in the vascular tissue and absolute hæmostasis to prevent the interposition of clots between the graft and its bed.
4. Rapid transplantation. The graft should be cut with a sharp shears after the field has been well prepared. A saw should not be used for this purpose as it injures the superficial layers by the heat it generates and the fine particles thrown off obliterate the openings of the haversian canals which will be rapidly penetrated by the new-formed capillaries if they remain permeable and the spongy bone is not compressed.
5. Absence of contact between the suture and the grafts. The grafts should rest on the largest possible surface on the subcortical osseous tissue, i.e., under the periosteum and the cortical layer but not reaching to the marrow.
6. Immobilization of the region operated upon.

In studying the pathogenesis and the process of cure of cases of this kind Lavalle has found:

1. That the graft has the power to provoke a condensing osteitis in its immediate surroundings, and thus directs the process of ossification. Ossification is especially abundant in bones with some inflammatory process such as a tuberculous epiphysis.
2. The graft, which extends from the shaft to the epiphysis without reaching the articular cavity, crosses the articular cartilage, and as the haversian

canals are promptly and abundantly penetrated by the capillaries, it serves to reduce the venous stasis and to bring the arterial blood to the epiphysis.

M. M. MATTHIES.

Martin, W.: The Treatment of Bone Cavities.
Ann. Surg., 1920, lxxi, 47.

In bone cavities in close proximity to a joint the removal of the roof and side walls with the idea of allowing the soft parts to fall in is almost impossible or necessitates a very difficult plastic operation. Moreover, in certain tunnels following compound fractures, the removal of all the bone on one side of the tunnel leaves the shaft very weak and with poor mechanical support. For these reasons attention is called to some of the other methods of closing bone cavities.

Chaput (1903) reported 4 cases in which he had successfully plugged with fat bone cavities left by osteomyelitis. Since then, about 50 cases have been reported. Calforio (1918) reported the results obtained with small fat transplants in cavities made in the upper extremity of the tibia in rabbits. From these experiments he concluded, first, that the fat did not remain as such in the bone, and second, that it was completely replaced by newly-formed osteoid tissue. X-ray observations of fat transplanted into bone in man show apparently similar results. In some instances there is little replacement of the fat by bone, in others complete replacement in a few months.

Fat therefore has been proved by both experiment and actual practice to have certain obvious advantages for the plugging of bone cavities. It does not readily support bacterial life, nor does it readily undergo decomposition. Moreover, when fat is broken down by the enzymes of bacteria it probably splits into fatty acids or their salts (soaps) and glycerine, none of which is especially harmful to the tissue. The fat seems to be easily taken up by the body cells and appears to have physical properties suitable for the healing of the overlying skin.

With regard to the treatment of infected bone cavities the author draws the following conclusions:

1. The complete removal of all the infected bone lining the cavity, all foreign bodies, and every particle of dead bone, is essential.

2. In the great majority of cases the cavity must be obliterated to insure healing. This is accomplished most satisfactorily by removing a sufficient amount of the wall of the cavity to allow the soft parts to fall in and fill it up.

3. In certain tunnels and cavities near the joints some form of plugging may be indicated and of the many materials used as plugs free fat transplants present obvious advantages. The two-stage operation, with careful sterilization of the cavity by the Carrel-Dakin technique is of great value.

4. After it is decided from the nature of the cavity or tunnel that a fat transplant is suitable, the

skin should be excised about the margin of the cavity and freed from the underlying tissue until its edges can be brought together. Exact hæmostasis of the soft parts is essential. A piece of fat distinctly larger than the cavity should then be excised from the abdominal wall and thrust into the cavity, the end of the graft being mushroomed through the opening in the bone and the skin closed over the graft with interrupted sutures. E. H. POOL.

ORTHOPEDICS IN GENERAL

Cotton, F. J.: "Flat-Foot" and Other Static Foot Troubles. *Boston M. & S. J.*, 1920, clxxxii, 1.

For the purposes of discussion the author divides foot troubles into five classes: (1) "flat-foot" (habitual; rigid; bony); (2) short heel cord; (3) contracted foot; (4) anterior arch trouble (Morton's disease; "fallen" arch); and (5) hallux valgus and rigidus.

Cases of so-called "flat-foot" constitute most of the cases which come for treatment. In this condition there is no real deformity—merely a position of relaxation into pronation which may be corrected. This habitual pronation is due to weakness of the muscles rather than to looseness of the ligaments. It is a physiological disorder and must be treated along physiological lines. Palliative measures such as hot-soaking and massage will relieve the tenderness. Changes in the shoe heels (Thomas heel) and the insertion of pads under the arches will give comfort, but a radical cure is to be obtained only by the education and exercise of the muscles. Under proper treatment the patient should get rid of supporting plates in three months. The muscles concerned are the tibialis anticus, the flexor longus hallucis, and the flexor longus digitorum.

Cultivation of the anterior tibial is of no value in the treatment of "flat-foot." The exercises advised are: (1) rolling the feet outward over the outer margin of the sole while standing, and (2) supination and plantar reflexion (standing on the toes with the heels turned in and attempting to grasp the floor with the toes). Most cases are cured by these methods. In those which do not yield the author recommends the use of an upright box of steel extending from the shoe heel to the upper calf on the outside to which the foot can be pulled over into a supinated position by means of a T-strap coming from the inner side of the shoe heel. The two arms of the T encircle the malleoli and bar and, when buckled up tight, hold the inner side of the foot upward and outward.

For the rigid spastic foot stretching of the contracted tendons under ether followed by the application of a cast to hold the foot in extreme supination for a week or so is advised instead of tenotomy. After this, the case should be treated in the same manner as the non-spastic type.

The bony "flat-foot" concerns the surgeon only insofar as it causes symptoms. Many feet of this type are perfectly serviceable. If the condition is

extreme and the symptoms are disabling, however, the best treatment is a cuneiform osteotomy (Ogston operation). This impairs the mobility of the foot but restores its balance.

The short heel cord is a frequent factor in foot troubles, especially in women who have lost the power of complete dorsal flexion by wearing high-heeled shoes. The tendon can be stretched in one or two sittings with a Davis wrench without the use of an anæsthetic. The author has not seen any considerable number of cases requiring tenotomy. After the cord has been stretched the case is resolved into a case of weak or pronated foot and should be treated accordingly.

The contracted foot is of the spastic type and nearly always congenital. There is a high arch, the heel cord is short, the toes are flexed like claws and pulled into hyperextension over the heads of the metatarsals by the contracted extensor tendons, the plantar fascia is tight, and the weight-bearing surfaces are calloused and tender, especially under the heads of the first and fifth metatarsals. A cure may be obtained by tenotomy (extensor tendons) and the

transplantation of the extensor proprius hallucis into the distal end of the first metatarsal. In two cases the sesamoids were removed with admirable results.

Metatarsalgia is common but Morton's disease (pressure on the nerves between the third and fourth metatarsal heads) is unusual. The common type is that of a tender central callus with most of the weight carried by the second and third metatarsal heads. These cases do not get well and always require care. A pad set in an insole behind the central callus is usually sufficient to make the foot comfortable. In some cases merely a strap around the foot just behind the ball is all that is necessary.

For hallux valgus operative remodeling of the joint and bursal excision are advised. The contracted external side of the joint capsule must be cut and the extensor hallucis tendon transplanted to the proximal phalanx of the great toe. This allows complete correction and prevents recurrence. The hypertrophied part of the metatarsal head, including about half of the joint surface, should be excised.

W. A. CLARK.

SURGERY OF THE SPINAL COLUMN AND CORD

Okinczyc, J.: A Case of Almost Total Section of the Spinal Cord by a Bullet Followed by Survival for Almost Four Years (Une observation de section presque totale de la moelle par balle avec survie de près de quatre ans). *Bull. et mém. Soc. de chir. de Par.*, 1919, xlv, 1499.

Okinczyc gives the detailed clinical history of a soldier whose spinal cord was almost completely sectioned by a bullet and who survived for three years and eleven months after the injury. There was no autopsy. Following the injury there was first a period of primary shock with abolition of voluntary movement, absence of sensation, absence of tendon reflexes, vesical retention, and fecal incontinence. This was followed by a period in which there were involuntary movements in the muscle masses of the paralyzed limbs, reappearance of the reflexes, cicatrization of the scars, and more or less complete evacuation of the bladder.

Lecène, who commented on the author's report, stated that Lhermitte, who made a special study of spinal lesions during the war, observed four cases of complete spinal section with survivals of eighteen, five, eight, and twelve months, respectively. In these four cases the response of the nerves and muscles of the paralyzed lower limbs to galvanic stimulation remained entirely normal while their response to faradic stimulation was somewhat diminished.

These facts prove unquestionably that section of the spinal cord may cause only slight modifications in the response of nerves and paralyzed muscles to electrical stimulation, and that the injury is never associated with degeneration such as oc-

curs following destructive lesions of the peripheral nerves.

From what has been learned during the war it is known that when the lower segment of the sectioned cord remains intact there is almost complete physiological integrity of the nerves emanating from it. This explains the automatism and the defense reflexes commonly observed in such cases. When the lower part of the cord is severely injured, however, there may be absence of response to electrical stimulation in the nerves and muscles dependent upon it.

From these facts it is evident that electrical examination of the nerves and muscles of a section of the body which has become paralyzed following an injury to the spinal cord will not indicate definitely whether the section of the cord is complete or incomplete. It will show merely the anatomical condition of the peripheral neurons of the segment subjacent to the cord lesion.

W. A. BRENNAN.

Lance and Jaubert: Infectious Spondylitis and Perispondylitis (Spondylites et perispondylites infectieuses). *Rev. de chir.*, Par., 1919, lvii, 607.

Among the soldiers sent to the hospital for treatment for Pott's disease the authors found a number who were suffering from spondylitis of infectious origin, so-called "rheumatismal" perispondylitis, or spondylitis of the tuberculous rheumatismal type described by Poncet.

When the inflammation in such cases is restricted to the spinal column radiography will show the development of bony excrescences on the vertebra which finally cause immobilization.

When the inflammation is more particularly perivertebral it is associated with other articular lesions, generally in the hip and knee. In these joints radiography will show the lesions of deforming ankylosing rheumatism.

In the authors' opinion the cause of ankylosing perispondylitis is infection, chiefly tuberculosis, and the predisposing factors are cold, dampness, fatigue, and trauma. The patients whose cases are reported in this article had had gonorrhœa, typhoid fever, tuberculosis, or some other infection masked by the symptoms of articular rheumatism. That syphilis may also be a cause seems evident from the fact that Charcot's spine is strikingly similar to the spine affected with the condition under discussion.

Only two methods of treatment give satisfactory results: (1) moderate mobilization, after the initial painful crises, and (2) heliotherapy. These measures seem to arrest the development of the bony processes and aid in the resorption of the exudate.

W. A. BRENNAN.

Sargent, P.: A Clinical Lecture on the Surgical Aspects of Spinal Tumors. *Brit. M. J.*, 1920, i, 37.

The author reviews the results of 27 operations performed by him in the past ten years for spinal-cord tumors. He describes the tumors as true neoplasms of different varieties associated with cord symptoms, and excludes all cases of syphilis, tuberculous disease, and cyst. He also reviews very fully the record of the first spinal-cord tumor removed, that excised by Sir Victor Horsley in 1887.

Four of the 27 tumors in the series were neurofibromata; 3, endotheliomata; 2, psammomata; 2, fibromata; and 2, fibromyxomata. In no case was the tumor above the fifth cervical or below the eleventh thoracic segment.

In briefly reviewing the symptoms, it was found that 8 patients complained of root pains and 9 of numbness in the legs associated with weakness (the latter symptom was present before operation in every case and varied from slight impairment to complete loss of all voluntary movements). In 3 instances stiffness, jerking, or weakness was the first symptom noticed by the patient. With one exception, the weak or paralyzed legs were spastic, though never to an extreme degree. In 8 of the 15 cases no impairment of vesical function was noticed at any time even though other symptoms had been present for periods varying from one to three years. In the remaining cases the impairment of vesical function amounted to little more than precipitancy or hesitancy of micturition, usually the former. The use of a catheter was very rarely necessary. In the neurological examination the Brown-Séquard syndrome was frequently observed.

The author believes that the clinical course of spinal-cord tumors is quite characteristic in that it is slowly progressive and temporary amelioration is rare. The progress of the disease is usually continuous until the patient becomes paralyzed and

completely loses pain, tactile, and temperature sensibilities below the segment involved.

The operative results in such cases are most striking in that the patient is relieved from pain immediately and the motor power returns very rapidly, usually before the return of sensation.

The results in 11 of the 15 cases in the series reported may be described as satisfactory in all respects. Six patients were doing their ordinary work when last heard from; 1, 77 years of age, is in perfect health and vigor; and the other 4 are so far recovered that the operation may be regarded as successful. Of the 4 patients treated unsuccessfully, 1, whose paralysis had existed for nine years before operation remains virtually *in statu quo* five and one-half years after the removal of the tumor. The 3 remaining patients died.

Twelve cases of tumor causing spinal-cord symptoms other than of the encapsulated intrathecal extramedullary type were encountered during the same period. These tumors contrasted strongly with the others. They were without exception of a malignant character although their degree of malignancy, judged clinically, was extremely variable.

In the author's conclusion he emphasizes the importance of an early exploratory laminectomy in the cases of patients suffering from cord lesions which give symptoms suggestive of spinal-cord tumors.

A. W. ADSON.

McNealy, R. W.: Congenital Depressions, Sinuses, and Cysts Occurring in the Sacrococcygeal Region. *Surg., Gynec. & Obst.*, 1919, xxix, 592.

Congenital depressions, sinuses, and cysts may be found in the median line of the back over the coccyx or in the lower portion of the sacrum. The author discusses only those having simple epithelial lining (simple dermoids). According to the degree of the anomaly these are classified by Wette as fovea sacrococcygea, fistula sacrococcygea, and epidermoid sacrococcygeal cysts. According to Depree and Lannelongue, this anomaly is found in one-third of all new-born infants and in 3 per cent of persons reaching adult age. The large majority of cases occur in males, and usually escape notice until they attract attention by becoming infected or rapidly increasing in size.

The fovea coccygea or simple depression as a rule causes little trouble. The sacrococcygeal fistula, a canal lined with epithelium which extends from the skin surface to a variable depth in the loose tissue, may be single or multiple. If there has been infection the epithelial lining is replaced by granulations and connective tissue. Often these fistulae contain loose hairs and in some cases they may be dilated at the bottom to form cysts. The cysts may contain cholesterolin, crystals, and the products of the skin glands as well as hairs. The fistulae may be primary or secondary. The formation of secondary fistulae follows suppuration and the discharge of the contents of a cyst.

The dermoids of the sacrococcygeal region vary in size. Usually they are situated just beneath the skin, but in some cases may be found deeper near the tip of the coccyx. As a rule the cysts are adherent to the skin or attached to it by the apex of an invagination of epidermis. They are usually connected to the spinal column by fibrous bands. The cyst walls vary in thickness, depending upon the amount of connective tissue present. Some of the cysts are lined with stratified squamous epithelium and show hair follicles and rudiments of sweat and sebaceous glands.

Many theories have been advanced to explain these cysts and fistulæ. It has been claimed that they are due to hair growing in an abnormal direction from the follicles which causes an inflammatory reaction; a rudimentary tail formation in man; the remains of a hydiorachis beginning in intra-uterine life; the persistence of a foetal connection between the external skin and the lining of the medullary canal; the persistence of a medullary tube; the abnormal development of ligamentum caudale; and the incomplete obliteration of the foetal canal. The theory usually accepted, however, is that of Tourneaux and Hermann who attribute them to certain departures from the normal in the develop-

ment of the caudal end of the spinal cord involving the infolding of the primary ectoderm. The simple depressions they believe are the result of more rapid growth of the soft parts which causes traction of the ligamentum caudale upon the vestiges coccygens. The cysts are of two types: (1) those due to dilatation of the epithelial sac which constitutes the vestiges medullaires coccygens, and (2) those due to dilatation of the deep part of a fistula or the occlusion of a fistulous tract near its outlet.

So far as treatment is concerned the author states that the simple depressions give no cause for surgical interference. When surgery is indicated the fistulæ may be carefully dissected out and, if there is no infection the wound may be closed immediately. If infection is present, it is best to allow the tract to granulate in after dissection. In cases of multiple fistulæ the various ramifications may be demonstrated by making roentgenograms after injecting Beck's paste or by the use of methylene blue in peroxide. Some of the cysts when infected must be drained before dissection may be done. These cysts are often confused with furuncles and when they are incised a chronic discharging sinus is left. The fistulæ described are not of anal, tubercular, or syphilitic origin.

I. W. BACH.

SURGERY OF THE NERVOUS SYSTEM

Boschi, G., and Perrone, A.: The Results of Surgical Operations on the Nerve Trunks (*Primi nostri risultati di interventi chirurgici sui tronchi nervosi*). *Policlino*, Roma, 1919, xxvi, sez. med., 385.

The authors performed a large number of operations in a neurological hospital of the Italian army. These surgical measures included direct and indirect nerve sutures, strip plastics, anastomoses, resections, etc. The experience is summarized briefly as follows:

1. Long and difficult operations involving nerves embedded in a mass of fibrous cicatricial tissue with intimate adhesions to the vessels were well borne. They were never followed by any disturbances such as pain, paræsthesia, etc., and it was never necessary to use such special measures as continuous irrigation with normal salt solution. Only the usual means to obtain maximum asepsis and perfect hæmostasis were employed.

2. It was found that the nerves could be stretched by gradual and gentle measures up to a maximum of 6 or 7 cm. This was especially true of the sciatic nerve. By stretching and forcibly flexing the limb it was possible to accomplish direct suture of the great sciatic to one of its terminal branches even when the original separation amounted to 9 or 10 cm. At the end of three weeks the limb functioned normally.

3. When causalgia was associated with compression of a nerve trunk a neurolysis which com-

pletely freed the nerve was a rapid aid to other methods of treating the causalgia. In one case in which complete interruption of the radial nerve was associated with causalgia of the musculocutaneous nerve the causalgia disappeared following implantation of the median nerve upon the radial, neurolysis of the musculocutaneous nerve which was strongly compressed by bone callus, and a few applications of high-frequency current. Generally when there was no syndrome of an actual break in a nerve neurolysis gave good results.

4. In cases in which an operation was performed to repair an actual interruption in the nerve the time which has elapsed has been too short to warrant definite conclusions as to the results, but signs already noted seem to indicate that the function of the muscles will be restored.

5. Direct suture of nerves is preferable to any other method. The results obtained by indirect methods of suture were not very satisfactory even when all precautions were taken to protect against adhesions.

6. Electrical stimulation of the nerve trunk during the operation is quite harmless and may be of great aid when the operation is difficult.

7. In many cases vascular lesions were found in association with the lesions of the nerves. These may have been responsible for some of the trophic and vasomotor disturbances attributed to the nerve lesions, and of themselves demand surgical intervention.

W. A. BRENNAN.

Frazier, C. H.: Surgical Problems in the Reconstruction of Peripheral Nerve Injuries. *Ann. Surg.*, 1920, lxxi, 1.

In order that the results of neurological examinations and the methods of recording the clinical findings might be as nearly uniform as possible, æsthesiometers were designed for the various reconstruction centers in this country in order that sensory disturbances might be tested and recorded in terms of grams. Special nerve registers for work on peripheral nerves were also distributed. While many examinations were made by competent neurologists abroad, the records were seldom sent with the patients to America.

Up to the present time over 3,000 cases of injuries to peripheral nerves have been returned to especially equipped hospitals. Of this number, 550 were admitted to General Hospital No. 11 and it is these cases which serve as the basis of the author's report. Two hundred and seventy-five of the patients (50 per cent) have been discharged as recovered; 75 have begun to recover function spontaneously; and 150 operative cases remain under observation.

A percentage of 25 or 30 seems a reasonably conservative estimate of the proportion of cases in which operation is justifiable. Surgery should be delayed at least three months after the wound has healed and at least six months after the injury. The action of supplementary muscles which may compensate for the paralyzed muscles is often misleading and many cases do not show signs of spontaneous degeneration until about the sixth month. If when there is evidence of complete physiological division, an operation were performed as soon as the wound would permit, many wounds would be explored unnecessarily and resection and suture would not only postpone recovery but might prove totally unsuccessful.

In operating, the tourniquet should not be applied routinely. In exceptional cases in which there is massive scar tissue, however, much time may be saved by its use. Liberal incisions, complete hæmostasis before closure, and careful scrutiny in the identification of the nerve trunks to prevent severance of important rami are always essential.

The least complicated operation is neurolysis. At General Hospital No. 11 this was performed in about 20 per cent of the cases. It is clearly indicated when the nerve responds promptly to faradic stimulation. In addition to external compression there may be present, particularly in the musculospiral nerve, an associated sclerosis or fibrosis of the nerve which may inhibit regeneration. It must be acknowledged that a neuroma *per se* is not an absolute barrier to the growth of neuraxes and therefore no attempt should be made to resect and suture a nerve because of a neuroma until six months have elapsed. The technique of neurolysis should free the nerve from the cause of compression and establish a new bed in an intermuscular plane or a plane between a muscle sheath and the deep fascia.

The greatest problems are those of resection and the bridging of defects. Of the numerous methods

advocated, there are only a few which should even be contemplated. Letievant's flap operation need not be considered as when the flaps are reflected the ends are not in alignment and lack of alignment interferes with the downward growth of neuraxes. While Huber has obtained good results in two cases of surgery *à distance*, attempts have not been successful when applied to man. Tubulization has been used extensively but the failures have been so numerous and good results so few that it is not to be recommended. The scar tissue which is usually formed in such cases defeats the purpose of the tube. Lateral anastomosis, as practiced by Hofmeister, is to be condemned and should not be confused with implantation suture. For the latter there is a limited field as in the arm where a large defect in the ulnar or musculospiral nerve may be bridged by a portion of the median nerve with only slight and transitory sensory loss.

Resection of the humerus has been done on two occasions by Frazier when the defect could not be bridged otherwise. This should be a two-stage operation. Nerve stretching with posture may be used to good advantage and a defect of 7 or 8 cm. overcome in this manner. In some cases the operation may be done in two stages. In the first stage the limb should be brought into flexion and the stumps anchored with silk. The final stage of the operation is then performed after four weeks. Nerve transposition is probably the most successful means of bridging gaps and is particularly applicable to the ulnar, the musculospiral, and the external popliteal. In all large defects advantage must be taken of favorable positions such as flexion of the forearm or knee. Only as a last resort should a nerve transplant be employed though there is definite evidence that regeneration takes place through the graft. The graft should be an autotransplant taken from the musculocutaneous, the sural, or the internal cutaneous, from two to four cables being used according to the size of the nerve.

In reckoning how much of the nerve is to be resected care should be taken to save as many fasciculi as possible. Electrical excitation is helpful in doubtful cases, the various parts of the nerve being stimulated at first through the sheath and then, if doubt still remains, after the sheath has been opened. The ultimate success of the suture depends largely upon the presence of healthy fasciculi free from the grasp of scar tissue. Every resource available must be employed to bring the segments into apposition without undue tension.

Finally, tendon transplantation should be resorted to in cases of residual paralysis of the extensor longus digitorum when the patient has recovered full power in all the muscles supplied by the musculospiral except the common extensors of the fingers. It is indicated also in cases of foot-drop in anterior tibial paralysis.

The after-treatment is of vital importance in all cases and consists of massage, galvanism (later faradism), properly selected exercises, and, when necessary, secondary operations. GATEWOOD.

MISCELLANEOUS

CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

Lane, W. A.: *Reflections on the Evolution of Disease*. *Lancet*, 1919, cxcvii, 1117.

The author reviews at length the mechanical aspect of chronic intestinal stasis. The abnormal mechanical deviation of the viscera is dependent upon two factors, first, the stagnation of the contents of the large bowel, and second, the downward pull and strain exerted upon the support of the loaded viscera. Long-continued strain upon the mesenteric supports results in the crystallization of the lines of force similar to that occurring in the skeleton. White streaks in the direction of the pull are the first indication that a peritoneal band is undergoing such a crystallization. Gradually a distinct membrane is formed which in most cases extends from the base of the mesentery to the surface of the bowel. At the onset these structures give beneficial support. Later, the spreading of the membrane over the surface of the intestine and the shrinkage of the firm bands tend to angulate and obstruct the lumen of the bowel.

Constrictions over the iliac colon, over the splenic flexure, and in the region of the cæcum are far reaching in their effects.

Fixation of the appendix by a band, or a membrane as it sometimes becomes in the region of the cæcum, adds to the obstruction by causing inflammation and contraction.

Irritation from constant impact of hard fecal masses on the mucous membrane in the pelvic colon may predispose to malignant disease. A heavy, dependent, and elongated pelvic colon may cause torsion of the loop and a chronic volvulus.

At the outset the excessive stagnation of material in the large bowel seems to have only a mechanical effect. Later, infective organisms may thrive in this stagnant mass and exert a marked effect on the body tissues. Primarily, the local delay, and later, the deficient assimilation of food, especially of carbohydrates, favors the growth of bacillus coli, streptococci, and other organisms. Because of the impurities thrown into the blood, there is a general depreciation of all the body tissues. The liver receives the results of this toxic, infective, stagnating mass from three sources: the portal vein, the portal artery, and by direct extension from the bile-duct. The spreading of the organisms to the gall-bladder may cause various gall-bladder complaints. The pancreas, infected through the pancreatic duct, may show marked inflammation or, in the latter stages, malignant degeneration.

The task of eliminating these toxins and organisms is thrown upon the kidneys. Various types of kidney troubles may follow: Bright's disease, localized infection, or even generalized pyelonephritis.

Atrophy of the various ductless glands and of the organs of generation is thought by the author to be a not infrequent sequel.

The effect of this auto-intoxication upon the brain and nervous system is striking. Headache, neuralgia, insomnia, and depression result in "neurasthenia", the invariable symptom of stasis.

The skin becomes coarse, dark, blotchy, and disfigured. The perspiration is profuse and offensive, the temperature is subnormal, and the extremities often cold and livid. The loss of fat and the consequent lack of support offered by fatty tissue result in a vicious circle. There is an added ptosis and an increase in the fundamental causes of the stasis.

The author favors any methods which will restore the normal state of the intestinal flow. Operative measures such as colectomy have shown striking results, especially in cases of rheumatoid arthritis and Still's disease.

Infections of the nasopharynx and dental sepsis are thought to increase the intensity of the infection and also to exaggerate the symptoms of auto-intoxication. The author lists various widespread and common diseases and conditions which result from chronic intestinal stasis. A. J. SCHOLL, JR.

Delbet, P.: *Research on the Toxicity of Muscle Pulp from the Point of View of the Pathogenesis of Shock* (Recherches sur la toxicité des muscles broyés au point de vue de la pathogénie du choc). *Rev. de chir.*, Par., 1919, lvii, 309.

The object of the experimental investigations on animals made by Delbet was to produce the condition called "traumatic shock" without the aid of traumatism. Starting with the assumption that the phenomena of shock are due to the resorption of tissues devitalized by trauma, Delbet injected into 213 untraumatized animals the pulp of macerated tissues obtained from other animals. The injections were made into the peritoneum because absorption there is rapid and the danger of embolism incident to venous injections is absent.

The phenomena usually observed in animals subjected to such injections were polypnœa, the abolition of reflexes, and coma, all of which are unquestionably manifestations of intoxication of the central nervous system. The toxins of muscle pulp, therefore, were proved to be toxic to the nerve cells.

In speaking of auto-, homo-, and heterotoxicity of the muscle pulp Delbet uses the term "autotoxicity" to indicate that the muscle pulp of an animal was toxic to that animal; "homotoxicity" to indicate that the muscle pulp removed from one animal was toxic to another animal of the same species; and "heterotoxicity" to mean that the muscle pulp of an animal of one species was toxic to an animal of another species. No autotoxicity experiments were made.

Homotoxicity varied greatly in the different species. The muscle pulp of gray rats and of frogs was very toxic to animals of the same species, while that of guinea pigs and of white rats was only slightly toxic to other animals of the same species.

A study of the experimental results shows: (1) that the animals whose muscles were homotoxic were sensitive not only to other homotoxic muscles but also to other muscles which had little or no homotoxicity; and (2) that animals whose muscles had little or no homotoxicity were but slightly sensitive to muscle pulp having a strong homotoxicity.

These facts indicate that the receptor plays a more important part than the heterogeneity of the muscle pulp injected. Certain animals were very sensitive to the toxin of muscle pulp; others were very resistant to it.

Delbet is convinced that the sensitiveness to the toxin of muscle pulp was due to very special characteristics. These he sought to discover by studying the points common to sensitive and resistant animals. There was but one common point. The sensitive animals were carnivorous, the resisting animals herbivorous. In the phenomena of shock, therefore, anaphylaxis may be a factor.

The results of these experiments, which were undertaken especially for the benefit of those wounded in war, may be of value also in civil surgery. Like war wounds, the extensive contusions and crushing injuries caused by vehicles and industrial machinery also produce the phenomena of shock. In such industrial injuries the surgical removal of the toxic area of devitalized muscles appears to be the dominant indication as in war wounds. The experimental results indicate also that the diet should be regulated before as well as after operation. Before operation it should be restricted to vegetable foods.

W. A. BRENNAN.

Lichty, J. A.: A Consideration of the Treatment of the Diseases of the Thyroid with Special Reference to So-Called Hyperthyroidism.
Am. J. Roentgenol., 1919, n.s. vi, 608.

As a working basis for the determination of the proper treatment for the individual case, the author divides the diseases of the thyroid into four groups. Group 1 includes cases in which there is hyper- or hypo-thyroidism without any apparent pathologic changes in the gland. These are recognized by the syndrome and the diagnosis may be confirmed by a study of the basal metabolism or possibly by the Goetsch test. The treatment is definitely medical.

The second group comprises cases of enlargement of the thyroid in which the age of the patient and the absence of certain symptoms lead to the diagnosis of adolescent thyroid. The condition is usually temporary and requires merely prophylactic measures or, at most, medical treatment.

Group 3 includes cases of thyroid enlargement with a definite active or potential hyperthyroidism. The enlargement may be due to hyperplasia of a

parenchymatous type or may be a colloid goiter, a cyst, an adenoma, or any combination of these. Properly selected cases of this group require surgical or roentgen therapy, but medical treatment may be advisable before either is given.

Group 4 includes cases having definite enlargement and pathology of the thyroid without any disturbances of the thyroid function. Cases of carcinoma, "simple" goiter, or colloid growths, as well as adenomata, cysts, and inflammatory reactions due to tuberculous, luetic, or other infections may belong in this class. These are imperatively surgical conditions, especially when they are malignant and when there is pressure which interferes with breathing or swallowing. Some of these cases may yield satisfactorily to roentgen treatment.

In conclusion the following summary is offered:

1. Exophthalmic goiter and hyperthyroidism from other causes should be recognized early and treated promptly.

2. The earlier the condition is recognized the greater the probability that medical treatment will be sufficient and give permanent results.

3. The neglected cases and those in which there is definite pathology are apt to require surgery or X-ray treatment.

4. As yet the indications for X-ray treatment of the enlarged thyroid do not seem definite and the results are not certain.

5. In cases of hyperthyroidism the roentgenologist and the surgeon are able only to break through a vicious circle for which the internist may or may not be responsible.

ADOLPH HARTUNG.

Rojas, P.; Epitheliofibrils in Cutaneous Tumors
(Las epiteliofibrillas en los tumores cutaneos). *An. d. Inst. mod. de clin. méd.*, 1919, iv, 110.

Throughout his work Rojas has used the staining method described by Río Hortega. In this article he first reviews the structure of the normal skin with regard to epitheliofibrils and then notes the alterations that takes place in these elements in cutaneous tumors and the skin surrounding them.

The alteration which is most common in the skin contiguous to tumors is excessive enlargement of practically all of the cells. The dermatosome is extraordinarily developed and at times occupies the greater part of the length of the intercellular bridge, thus giving it the aspect of a stout rigid fiber.

Rojas has observed only four cases of epithelioma of the malpighian type with epithelial pearls, three of the lip, and one of the vulva. The changes in the pearls differed from those in the rest of the tumor but in both the fibrils had undergone profound changes which made them quite different from normal fibrils and those of the skin in the vicinity of the tumor. With respect to the size, quantity, and distribution there was every possible variety. There were cells in which the entire stoma was surrounded by fibrils and others which showed only a few or none at all.

In the epithelial pearls the fibrils were visible in the peripheral cells but very thin and poorly stained with the silver. In the middle layers they were thicker and traversed the cells in various directions, anastomosing with the neighboring cells by means of extremely thick intercellular bridges (dermatosomes). In the central cells the epitheliofibrils were found rarely.

Another alteration which was seen repeatedly was enormous enlargement of the fibrils of the cells which surrounded the pearls, many of which had lost their clear-cut outlines. Here the fibrils appeared parallel in longer or shorter lines as if agglutinated in fascicles. After extending for some distance they curved, forming a sort of hook, and then ended abruptly.

In the epitheliomatous nodules in which the cells kept the typical structure the fibrils were as a rule similar in every way to those of the filamentous layer of the normal skin. In other places the fibrils lost their normal structure, became sinuous, and surrounded the nucleus like a wreath. Occasionally spreading out from these wreaths were fine branches which passed over the nucleus and formed a sort of basket.

In the nodules in which the cells were not entirely atypical and still conserved the form and some of the characteristics of normal cells, the fibrils were not so regular as in the type just described. They were very delicate and granular and had the appearance of a string of small granules.

In completely atypical nodules the fibrils were disposed very differently. Generally they followed a course parallel to the long axis of the cell, sometimes passing over the nucleus and sometimes dividing into two and circumscribing an ellipse. In some pyriform cells the fibrils were condensed at the sharp end of the cell and, spreading out like a fan, surrounded the nucleus. Immediately beyond it, however, they curved inward and again took up their course, passing in a straight line to another cell. In the large lanceolate cells which are frequently seen in this type of tumor the fibrils were condensed at both ends of the cell and spread out in the same shape as the cell.

Of the tubular epitheliomata without epithelial pearls the author has seen only one case, an epithelioma on the skin of the scrotum which originated from the sweat glands.

There were two distinct zones in this tumor, one in which the cells kept their well-defined contour, and the other in which the outline has been almost entirely lost. In general, the epitheliofibrils were much more delicate than in the type of tumor previously described.

In the zone where the cells kept their contour the fibrils were variously disposed and at times acquired such a peculiar character that it was impossible to correlate them with any normal type. These cells did not present very marked degenerative lesions. In the arrangement most frequently seen the fibrils were condensed in the perinuclear region

and formed a cavity at the nucleus. Then they resolved themselves into a quantity of small filaments and passed out of the cell into a neighboring cell.

In the zone of the tumor where the cells had lost their contour the nucleus was seen in the midst of an intricate fibrillar reticulum. The fibers were extremely delicate and had lost all order or system.

The author studied only one rodent ulcer and this had been fixed in alcohol before he received it. Satisfactory sections could not be obtained.

Rojas describes further minor variations of the fibrils in all the types studied and illustrates his article with a large number of photomicrographs. His conclusions are:

1. The epitheliofibrils of the neoplastic cells in cutaneous tumors undergo marked alterations. These changes are always in relation to those which the cell itself undergoes.
2. The alterations are of two types: alterations of structure and alterations in the position within the cell.
3. Alterations in structure are manifested by total or partial enlargement of the fibril and by sinuosity.
4. The alterations in the order in which the fibrils are placed is manifested by simplicity in the architecture of the cellular reticulum.
5. There are early cellular alterations which, acting on the cellular ectoplasm, react upon the epitheliofibrils, producing in them great disorganization.
6. In the malignant tumors observed there were no specific alterations of the epitheliofibrils.

M. M. MATTHIES.

Mercadé, S.: Woody Phlegmons (Les phlegmons ligneux). *J. de chir.*, Par., 1919, xv, 499.

The author believes that there is no need for revising the accepted views regarding the nature of woody phlegmons. His observations of 10 cases, the clinical histories of which he gives in this article, indicate that this type of phlegmon, though peculiar, is not to be classed as a special pathologic entity.

Two factors are necessary for the development of a woody phlegmon. The first is the presence of some foreign body or substance which sets up a slight infection. The second is the slowly developing reaction to the infection. In all cases in which a bacteriological examination has been made different types of bacteria of varying degrees of virulence have been found. The theory that the condition is caused by any one type of infective agent therefore cannot be admitted. The woody phlegmon is due rather to the reaction of the organism. This reaction occurs only in cellular tissue which defends itself and neighboring organs by forming successive layers of fibrous tissue about the invader. It is only a tumor formed of the fibrous tissue developed about a small, slightly virulent foreign body.

The rational treatment consists of a large incision of the tumor along its principal axis and dilaceration.

In some cases if rigorous disinfection of the area is assured, secondary suture can be done after a few days.

W. A. BRENNAN.

Ordway, T., Tait, J., and Knudson, A.: Metabolism in Leukæmia and Cancer during Radium Treatment. *Albany M. Ann.*, 1920, xli, 1.

It has been noted that in certain instances patients undergoing radium and X-ray treatment for leukæmia have constitutional symptoms such as nausea (more rarely vomiting), malaise, weakness (even prostration), headache, undue fatigue, unusual need of sleep, increased excitability, fretfulness, irritability, disorders of menstruation, or attacks of dizziness. The same symptoms have been noted also in normal persons subjected during their routine work to emanations from radium. It is doubtful, however, if it can be proved that they are due to radium exposure as all of them are more or less common.

In this paper the authors report the result of their studies in four cases in which radium and X-ray treatments were given. Two of the patients were being treated for myelogenous leukæmia, one for extensive sarcoma of the right clavicular region, and one for carcinoma of the breast. A record was kept of all the food taken, and the urine was collected and examined every twenty-four hours.

It seemed evident from these cases that the changes in the nitrogen metabolism depend upon the amount and nature of the tissue autolysis. Both the tissue autolysis and the products of nitrogen metabolism were most marked in the two cases of leukæmia. In these also, due to the nature of the tissue autolysis, there was an extraordinary increase in the phosphates. In the case of sarcoma the amount of tissue autolyzed was much less than in the cases of leukæmia and the nitrogen products, while definitely increased, were much less. In the case of carcinoma the lesion consisted of a hard, brawny fibrous tissue in which little or no autolysis was to be expected. In this case there was practically no increase in the products of nitrogen metabolism. The results obtained in this investigation throw no light on the constitutional symptoms mentioned.

I. W. BACH.

Mayo, W. J.: The Relation of Cancer to the Prolongation of Human Life. *Surg., Gynec. & Obst.*, 1920, xxx, 22.

The great enemy of middle and old age is cancer, and measures both for prevention and for cure have not advanced in proportion to the increasing need. One woman in 9 and one man in 13 dies of cancer. The knowledge that chronic irritation is the great underlying cause of the disease must become more widespread.

The majority of cancer patients come to operation too late to be cured. The inoperability in a given case cannot always be demonstrated and therefore operation must be done in many questionable cases in order that the patient may be given the benefit of

the doubt. In resection of the stomach, for instance, the mortality in the favorable cases is low, but some of the most extensive resections result in cures although the risk is greatly increased.

Too little attention has been paid to traumatic transplantation of malignant cells during operation. Rough handling of the growth loosens cells which may become grafted on any surface denuded of its normal covering. Operative methods must be devised that will more effectively prevent cell transplantation as well as the traumatic detachment of cancer-infected thrombi into vascular channels—a complication which frequently causes postoperative metastatic carcinoma of the liver and lungs.

Malignancy is the property of the cell; the stroma is not a part of the neoplasm but the measure of nature's defense. Malignant cells will sometimes be found encapsulated in the tissues of an operative field from which a neoplasm has been removed. Occasionally through some agency such as traumatism or disease, the retaining wall is broken down and metastasis occurs after many years of apparent operative cure. Radiotherapy destroys cells for a certain distance and sterilizes them at a greater distance so that their reproduction is checked. Connective tissue then develops which acts as a barrier to the further extension of the malignant process.

Radiotherapy has been found of great value in the postoperative treatment of cancer. It would appear to be most useful, however, in preparing a malignant area against wound grafting during operation and in temporarily reducing the vitality of the malignant cell. Whether applied as radium, X-ray, or heat, it sickens malignant cells beyond the area of destruction. During this period the resistance of the cells is reduced and operation is most efficient; it should not be delayed more than a week or two as the period of increased cell vulnerability is probably short and the connective-tissue development which interferes with late operation is rapid. When the use of radio-active agents is properly combined with surgery, operability is increased, mortality is lowered, and the percentage of cures is increased.

Abstract sciences are being utilized and scientific facts, apparently unrelated, are beginning to be understood in their relation to medicine. Much may be expected from bringing certain other branches of science, especially physics, to the aid of biochemistry in the study of physiology and pathology. In 1827 the botanist, Brown, discovered the movements of ultramicroscopic bodies suspended in gases or fluids, the so-called "Brownian movements." In 1861 Thomas Graham, Master of the Mint in London, called attention to colloids and stated that they consist of matter in a special state of subdivision in which each colloid particle is an entity but that except in its physical state the matter remains unchanged. It has been shown that these colloid particles are endowed with movement and that while they are not visible they are of sufficient

size to reflect rays of light. The tissues of the body are in a colloidal state and retain their form and energy while the non-colloidal elements of the blood, such as sugar and amino acids, diffuse through the tissues, furnishing food which is utilized by the tissue colloids. Crookes developed the cathode ray which was the inception of the X-ray and related in physics to the ionic theory and electrons.

The biochemists have shown that when certain substances are in the colloidal state they are more toxic than when they are in other states, and this peculiarity has been attributed by some physicists to the energy contained in the colloid body.

Particular attention is called to the contributions of the abstract sciences to cancer research, and more intensive study in these new fields is urged.

Embleton, D.: Sphenoidal Empyema and Epidemic Cerebrospinal Fever. *Brit. M. J.*, 1920, i, 7.

The author reports that in 34 cases in which death was caused by cerebrospinal fever the autopsy findings showed empyema of the sphenoid sinus in 32.

In the two cases in which it was not found, the deaths occurred late in the course of the disease, on the twenty-seventh and twenty-eighth days respectively. One of these cases was acute, the other recrudescence. Meningococci were found in the sinus in 20 cases and in the bone in 3.

Empyema of the sphenoid sinus was not found in any other disease except "Spanish influenza." Neither was evidence of it discovered in a rhinological examination of 47 patients who had completely recovered from cerebrospinal fever or in chronic carriers of the meningococcus.

Ten cases of hydrocephalus were examined by the author. Five of these were operated upon to drain the sphenoid sinus. All the patients were temporarily worse but 3 recovered. It was found that when the operation was performed in the acute stage of the disease the results were poor.

The primary site of entrance of the meningococcus is the nasopharynx. The bacterium is found here during the incubation period and early in an attack of the fever. It is found also in many carriers who show no signs of disease other than "colds." Evidently the factor causing the development of meningitis is not always a rise in virulence of any one bacterium as in the epidemics studied the organisms were usually of two or three serological types rather than of a single type.

The frequency of its occurrence suggests that empyema of the sphenoid sinus may be a determining factor in the meningitic form of cerebrospinal fever.

In the author's opinion the meningococci do not gain access to the meninges through the arachnoid prolongations about the olfactory nerve or by way of the perineural lymphatics, but pass from the

sphenoid sinus to the meninges directly by way of the lymphatics. In this connection there may or may not be gross signs of inflammation. The other probable route of infection is through the blood stream. The condition may begin with simple "catarrh" which either passes off or becomes chronic. This is followed by a vigorous reaction in the nasal mucosa which is followed in turn by sphenoid empyema. The latter may produce a general blood infection with or without involvement of the meninges.

If the empyema disappears the body may be able to deal with the systemic infection, but if it persists and the discharge of organisms from the focus continues, the bodily resistance may prove insufficient and fatal results may follow. Should the empyema become quiescent, it may light up in a recrudescence or keep up a smouldering infection which will lead eventually to hydrocephalus.

G. S. FOULDS.

Alamartine, H., and Vandenbosche, H.: Paludism and Surgery (Paludisme et chirurgie). *Rev. de chir.*, Par., 1919, lvii, 567.

The author discusses the surgical conditions caused by hæmatozoön and classifies them as follows: (1) the acute abdominal syndrome developing in the course of paludism; (2) the paludal spleen; and (3) gangrene of the limbs caused by paludal endarteritis.

The acute abdominal syndrome is a crisis of pseudo-appendicitis or pseudovisceral perforation and is observed particularly in the beginning of paludism. Generally the diagnosis is cleared within a few hours by the onset of distinct paludal symptoms.

The paludal liver is surgically important because of its fragility, and its easy spontaneous rupture in case of a minor abdominal contusion. Moreover, it is frequently the site of abscesses and torsion. In some instances of hypertrophied liver due to paludism and in chronic cases of paludism, splenectomy is advised. Although this operation does not result in a definite cure, it greatly improves cases which have resisted medical treatment.

The development of gangrene in the course of paludism is not uncommon. From the authors' recent observations in Macedonia it would appear that such gangrene of the lower limbs is frequent. In 1916 a number of soldiers were admitted to the Salonica hospitals who were believed to have frozen fingers and toes. These men were suffering from paludism and disturbances of the peripheral circulation, and it was this fact coupled with the paradox of so-called "frozen feet" in Macedonia in a warm season of the year that called attention to the nature of the gangrene. Some of the cases of symmetrical paludal gangrene were very severe and the patients soon died. Autopsies showed that the obliterating endarteritis was generalized in the small visceral arteries as well as in the large trunks of the limb.

W. A. BRENNAN.

BLOOD

Pappenheimer, A. M., and Vance, M.: The Effects of Intravenous Injections of Dichloroethylsulphide in Rabbits, with Special Reference to Its Leucotoxic Action. *J. Exper. M.*, 1920, **xxi**, 71.

The authors review the evidence indicating the general toxicity of dichloroethylsulphide both when administered by inhalation and when injected subcutaneously or intravenously. They also review the literature on the subject.

This report deals with the effects of the intravenous injection of dichloroethylsulphide into rabbits, special attention being given to the alterations in the blood picture and the blood-forming organs since these were the most striking of the results observed.

At first, difficulty was experienced in obtaining suitable emulsions for injection. In the earlier experiments the given amount of a 10 per cent alcoholic solution by weight of dichloroethylsulphide was suspended in 0.85 per cent salt solution, shaken vigorously, and injected immediately after the larger globules had settled out. The dose administered was therefore considerably less than the total amount taken. Later it was found that a more satisfactory suspension could be made by emulsifying in 30 per cent alcohol in distilled water. A slightly milky emulsion was obtained which after shaking did not separate out in the time necessary for injection. The suspension was prepared from a recently made, accurately weighed 10 per cent solution in absolute alcohol and injected at once to avoid hydrolysis. The dichloroethylsulphide used was a distillate which was obtained from the contents of a German yellow-cross shell and was actively vesicant.

The authors did not attempt to determine accurately the minimum lethal dose. In the earlier experiments they found that the limit of tolerance was in the neighborhood of 0.01 gm. per kilo, and accordingly, for the last six rabbits a uniform dose of 0.005 gm. per kilo was chosen.

The symptoms observed were emaciation and loss of weight, nervous symptoms, respiratory symptoms, intestinal disturbances and œdema. The article contains a detailed description of the pathology of the changes observed and a series of tables and charts of the findings. The conclusions drawn are:

The lethal dose of dichloroethylsulphide distilled from a German yellow-cross shell was from 0.005 to 0.01 gm. per kilo when injected intravenously into rabbits.

Rabbits which died within twenty-four hours showed extensive hæmorrhages and œdema of the lungs.

Severe lesions of the intestinal tract were present in about one-third of the rabbits.

Dichloroethylsulphide injected intravenously was specifically poisonous to the hæmatopoietic tissues.

Severe lesions were caused in the bone marrow and the number of circulating leucocytes was markedly diminished. In animals surviving the injection regeneration occurred. The granular cells of the bone marrow seemed to be more sensitive than the lymphoid cells and the erythrocytes.

The effect upon the blood and hæmatopoietic tissues was not due to the admixture of nitrobenzene or chlorobenzene in the shell filling. Injection of these substances into animals in amounts many times greater than the total dose of dichloroethylsulphide used produced no changes in the blood picture, while the subsequent injection of dichloroethylsulphide free from these solvents produced a typical reaction.

G. E. BEILBY.

BLOOD AND LYMPH VESSELS

Laurenti, T.: Traumatic Aneurisms of the Limbs (Contributo clinico alla casistica degli aneurismi traumatici degli arti). *Polichin.*, Roma, 1919, **xxvi**, sez. chir., 313.

Laurenti gives the clinical histories of 8 traumatic aneurisms of the limbs observed in soldiers during the war.

Arteriovenous aneurisms, those which are observed most frequently in war surgery, are characterized by the permanent communication of an artery with a vein. Two types may be distinguished, those with a sac and those without a sac. In the latter type the aneurism is merely a simple arteriovenous fistula. The condition is brought about by external violence which causes weakening or rupture of the muscles. Trauma which opens an artery may at the same time open a vein in such a way that the blood from the newly formed sac may pass into the venous lumen. The resulting condition is termed a "varicose aneurism." The term "aneurismal varix" is applied to a sac formed as the result of the thinning and weakening of the venous wall which is intimately adherent at the edges of the aperture with the walls of the artery.

A spontaneous arteriovenous aneurism results when an arterial aneurismal sac is adherent to and perforates a vein. The majority of arteriovenous aneurisms are of traumatic origin. The femoral, popliteal, and humeral arteries are those most frequently involved.

Traumatic aneurisms are for the most part false aneurisms—circumscribed hæmatomata, the walls of which have become thickened and organized. They may be secondary to incomplete arterial lesions or progressive distention of an arterial cicatrix.

So-called "traumatic aneurisms" are seldom true aneurisms.

The 8 cases reported by Laurenti belong to the group of false traumatic aneurisms. Six of them were treated by ligation with good results. In one case the artery was ligated and the vein sutured and in another a tampon was used. All of the patients recovered.

W. A. BRENNAN.

Martin, J.: *Ligation of the Common Femoral Vessels; A Contribution to the Study of Toxæmic Shock* (Ligature des vaisseaux fémoraux communs; contribution à l'étude di choc toxémique). *Bull. et mém. Soc. de chir. de Par.*, 1919, xlv, 1471.

Martin does not share the opinion expressed by Sencert that ligation of the femoral artery does not endanger the vitality of the limb as is commonly believed. He reports four cases in which the condition following such ligation lead to death or necessitated amputation. In two of these cases he believes the results were due to ischæmic mortification without associated sepsis; that there was necrosis or aseptic mortification of the tissues rather than gangrene, a term which should be applied only to mortification followed by putrefaction. That such aseptic necrosis may cause general symptoms is beyond question. In both cases the general symptoms which developed within six hours after the ligation were those due to toxæmia rather than infection. It has been well established experimentally that ischæmia rapidly causes toxæmia by chemical changes in the ischæmic tissues, and that muscular rigidity is a manifestation and proof of these chemical changes which are quite independent of bacterial action.

In cases of such mortification high amputation is indicated and delay is dangerous. A patient who has had a ligation of the common femoral vessels should be watched from hour to hour. If the signs of mortification appear, and especially if there is muscular rigidity, immediate surgical intervention is indicated.

W. A. BRENNAN.

GENERAL BACTERIAL INFECTIONS

Brown, J. H.: *The Cultural Differentiation of Beta Hæmolytic Streptococci of Human and Bovine Origin*. *J. Exper. M.*, 1920, xxxi, 35.

Hæmolytic streptococci are common in good dairy products and are usually harmless to the consumer, but it is desirable to be able to distinguish such streptococci from the hæmolytic streptococci pathogenic to man which are sometimes found in dairy products. Up to the time of the author's investigation no qualitative method for distinguishing hæmolytic streptococci of human and of bovine origin had been described and therefore such differentiation depended upon the recognition of certain quantitative differences such as the agglutination or precipitating titer against human serum, the rapidity with which hæmolysis appeared, the size or definiteness of the hæmolized zone in a blood-agar plate, the rate at which milk was coagulated, the degree of acidity produced in carbohydrate media, and the action of a bouillon culture on blood corpuscles in suspension. Anything which tended to simplify the determination of these quantitative differences was of value. Acquaintance with the minute details of appearances in blood agar was important. Avery and Cullen showed the advantage also of determining the hydrogenion concentration in dextrose-bouillon cultures.

The author's desire was to emphasize the value in such differentiation of differences in the action of streptococci of human and of bovine origin on blood corpuscles in fluid media. He describes the method recommended by the Medical Department of the United States Army for the identification of the streptococcus hæmolyticus and gives in tabular form the results of the test upon twenty-eight strains of streptococci of bovine and human origin. Since 1915 he has employed a technique slightly different from that recommended by the Army, a little more simple and giving practically the same results.

None of the procedures employed by Brown served in itself to differentiate streptococci of human and of bovine origin with certainty though each of them gave strong presumptive evidence. Most of the strains fell easily into the human or bovine group by all the tests. Eliminating these from consideration, three of the others Brown was inclined to regard as of undoubted bovine origin and one as representative of a group of streptococci which Jones found in milk. The latter is being studied further. The origin of only one strain was doubtful.

G. E. BEILBY.

SURGICAL DIAGNOSIS, PATHOLOGY, AND THERAPEUTICS

Carrera, J. L.: *A Pathologic Study of the Lungs in 152 Autopsy Cases of Syphilis*. *Am. J. Syphilis*, 1920, iv, 1.

In this article pulmonary syphilis is considered from the standpoint of the new pathologic criteria set up by such investigators as Warthin and Fordyce.

The author has made a most extensive survey of the literature of the subject and finds that the consensus of opinion, especially among the later writers, is that, with the exception of gumma of the lung, very little is known regarding pulmonary syphilis.

In the 152 cases studied undoubted syphilitic lung lesions were found in only 12 (8 per cent). A very marked fibrosis was found in 18 cases, and well-marked brown induration in 43. An increase of connective tissue associated with chronic passive congestion was present in 124 cases. These findings are in accord with the changes produced by syphilis in other organs.

To differentiate the fibrosis of syphilis from that of tuberculosis 60 tuberculous lungs were studied microscopically. The tubercle appears as a vascular, closely packed, epithelioid, sharply circumscribed, conglomerate entity while the gumma is more loosely arranged, less sharply limited, possessed of vascular granulation tissue, poor in epithelioid and giant cells, and infiltrated with lymphocytes and plasma cells. The most conclusive difference is the presence in suspected lungs of collections of plasma cells. In tuberculosis of the blood vessels all three coats are involved while in syphilis the middle coat as a rule shows no alteration.

If an autopsy case shows a well-marked brown induration it is more probable that the condition is due to syphilis than to any other disease. In the

connective tissue of syphilitic fibrosis the presence of small, diffuse or focal collections of lymphocytes and plasma cells, with or without typical gumma formation and associated with characteristic vascular changes, makes the differential diagnosis between the two conditions possible.

The fibrosis of syphilis may be distinguished from that of chronic passive congestion by the presence of vascular connective-tissue bundles outside the vessels and evidences of plasma-cell infiltration.

The presence of the cuboidal cells of Tripiër does not favor the diagnosis of syphilis as these cells are found in any chronic fibroid process in the lung.

In the cases studied no changes characteristic of syphilis were to be found in the pleura. Typical active syphilitic peribronchitis was found in only 2 cases. The microscopic picture of each is described in detail.

The author believes that in the adult it is impossible to distinguish between congenital and acquired pulmonary syphilis. The differential points as given by Roessle do not hold.

No changes were found in the bronchial mucous glands and in only one case did the peribronchial lymph nodes show marked typical syphilitic vascular formations and thickenings and plasma-cell collections. In this case spirochaetes were discovered in the artery, the aneurism wall, and the peribronchial infiltrations.

The following conditions were found in the 152 cases studied:

Condition	Cases
Chronic passive congestion (well-marked).....	124
Marked brown induration.....	43
Marked fibrosis without brown induration....	18
Hæmorrhagic infarction.....	28
Pulmonary thrombosis.....	14
Edema of the lungs.....	35
Atelectasis (subpleural).....	16
Bronchopneumonia.....	45
Tubercles (of clinical importance).....	21
Excessive anthracosis.....	61
Emphysema.....	42
Chronic pleuritis.....	19
Bronchiectasis.....	6
Corpora amylacea.....	6
Pulmonary gangrene.....	6
Fibrosis of peribronchial nodes.....	2

P. M. CHASE.

Ziegelman, E. F., and Mangan, L. A.: A Method for the Treatment of Burns with Bleb Formation. *Am. J. Surg.*, 1919, xxxiv, 10.

This method is based upon the use of sodium bicarbonate and is called the "modified sodium bicarbonate method." It is applicable only to burns with bullæ or bleb formation.

A fair-sized needle, attached to a large record or similar syringe, is inserted into the bleb at its most dependent portion and, if possible, the fluid content of the bleb is withdrawn. In cases of large bleb formation the syringe may be filled several times.

After all the serum has been removed a 4 per cent solution of sodium bicarbonate is injected into the bleb until it is entirely filled and allowed to remain for from four to eight hours. In certain cases it is impossible to aspirate the serum in the bleb. It is then necessary to inject a little sodium bicarbonate solution and allow it to mix with the bleb contents for a few hours. At the end of that time it will be found that the combined material can be aspirated easily. The bleb is then filled again with the bicarbonate solution as in other cases.

This process is repeated. When the burn is severe it is repeated several times. Great care must be taken to avoid breaking the skin covering the bleb while aspirating and when the dressings (if dressings are necessary) are removed. In keeping the dressings from adhering to the loose surface of the bleb it has been found that the best results are obtained with the use of "ambrine" or paraffin-gauze.

When the secretions have ceased to form, a fine powder, preferably zinc oxide, is dusted over the surface. In from five to eight days the epidermis in the form of dry scales may be easily removed and a healthy dry surface with the appearance of sun-burn remains.

By this method the period of convalescence is greatly shortened and dangerous complications are avoided. The authors have had no case of infection, and though their number of cases has been exceedingly small, they are convinced that the procedure described will greatly lessen the incidence of infection.

E. C. ROBITSHEK.

Taylor, J. S.: The Paraffin-Wax Treatment of Burns with Special Reference to Mustard-Gas Burns. *Mil. Surgeon*, 1920, xlv, 83.

The author treated 258 mustard-gas burns which ranged in severity from burns of the first degree to burns of the third degree. Some of them were very extensive and others small. All of the wounds were infected before they were seen by the author. The previous treatment had consisted of the use of alkaline baths, lotions, dusting powders, and vaseline. Taylor advocates the Carrel technique and enumerates the steps in the dressing as follows:

1. The dressings are removed.
2. The burned area is bathed with neutral sodium soap.

3. The burn is swabbed with sterile absorbent cotton pledgets held in a sterile hæmostat. These pledgets are soft and are soaped. The entire burned area is cleaned with a circular rubbing motion from the center to the periphery and the skin around the periphery is thoroughly scrubbed.

4. The soap is removed with warm sterile water and the use of other sterile cotton pledgets. The cleansing process is one of the most important steps in the technique. If it is done correctly there will be no bleeding, pain, or distress. In some cases the secretions are more easily removed if normal salt solution is substituted for the sterile water.

5. After being cleansed the area is thoroughly dried either with sterile cotton pledgets or a blower.

6. The area and at least one-fourth of the skin around the periphery are sprayed with ambrine or paraffin wax.

7. Upon the layer of ambrine a thin layer or film of sterile absorbent cotton is then applied immediately. This layer should also extend at least $\frac{1}{4}$ in. beyond the limits of the burned area.

8. The film of cotton is then sprayed with a second layer of the paraffin wax.

9. Over the second layer of paraffin wax a second and thicker layer of cotton is applied.

10. Over the second layer of cotton are placed a layer of gauze and a bandage. The amount of cotton and gauze necessary to complete the dressing depends upon the amount of the secretions.

11. The wound is redressed every twenty or forty-eight hours according to the amount of the secretions.

In concluding Taylor sums up as follows:

All burns are sterile at the time they are first received and are infected clinically and bacteriologically at least twelve hours after their receipt. The Carrel technique in the treatment of burns is superior to any other. The use of paraffin wax has been proved of value in every particular as it shortens the time of disability, lessens the suffering, and prevents deformities and the frightful contracting cicatrices.

E. C. ROBITSHEK.

EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

Bagg, H. J.: Pathologic Changes Accompanying the Injection of an Active Deposit of Radium Emanation. I. Intravenous and Subcutaneous Injections in the White Rat. *J. Cancer Research*, 1920, v, 1.

Very little is known concerning the changes that occur in living tissue following the injection of solutions of an "active deposit" of radium emanation. The investigation here reported was undertaken by the author to determine the nature of the changes in the principal organs of the animal body following such treatment and to obtain data that might serve as a guide in the treatment of certain types of cancer to which the solution method of radium therapy appears particularly adapted.

The investigation consisted of two parts, the first dealing with intravenous injections, and the second with subcutaneous injections of the "active deposit" of radium emanation.

Following injections of an "active deposit" of radium emanation there was a diffusion of the radioactive substance throughout the animal body which resulted in pathologic changes in the various organs. The changes occurring in the liver, lungs, kidneys, adrenals, spleen, bone marrow, brain, and vascular system are minutely described. The most interesting change was fatty degeneration in the liver which was brought about by comparatively small

subcutaneous doses of radium. This degeneration was characterized by the presence of many giant cells and hyperchromatic nuclei, and persisted for a comparatively long time after the treatment.

Frequently following large doses of radium, congestion and hæmorrhages were found in practically all of the organs. In the severe cases the animals died with symptoms of severe enteritis.

The pathologic condition most frequently found in the kidney was a granular degeneration and erosion of the renal cells.

In the bones the injections of radium caused the destruction of the cells of the bone marrow and their replacement by blood.

In the spleen congestion was the most constant feature following the treatment, and in some cases this was associated with hæmorrhages and the destruction of red blood cells.

In certain organs the method of injecting the radium determined to a certain extent, the severity of the reaction. For example, following subcutaneous injections there was no appreciable pathologic reaction in the lungs, but following intravenous doses of about the same strength, the pulmonary lesions were severe, consisting of proliferation and desquamation of the epithelial cells of the bronchi, marked œdema, congestion, and hæmorrhage.

It appeared that doses of radium less than 10 mc. were not fatal to the experimental animals. Doses above this amount caused death within a few hours or a few days, the reaction being somewhat less severe when the injection was subcutaneous.

A similarity was noted in the tissue reaction due to radium injected intravenously or subcutaneously and radium applied externally.

The fate of radium after its injection in the animal organism and its subsequent elimination are discussed in some detail. The results of this investigation show that the liver, gastro-intestinal tract, kidneys, lungs, and spleen received the greatest amount of radio-activity.

Degenerative changes in the cell and their interpretation are also discussed. The histologic study seemed to indicate that cytoplasmic changes occurring in the cell were profound and as severe as those in the nucleoplasm.

G. E. BEILBY.

Murphy, J. B., and Waro, N.: The Lymphocyte in Natural and Induced Resistance to Transplanted Cancer. V. Histologic Study of the Lymphoid Tissue of Mice with Induced Immunity to Transplanted Cancer. *J. Exper. M.*, 1920, xxxi, 1.

Although a number of theories have been brought forward to explain the natural and induced resistance of mice to transplanted cancers, none of them has covered all the facts or met with general acceptance.

In this paper the authors present a study of the lymphoid organs in animals with induced immunity to cancer which was made to establish a further link in the evidence associating the lymphocyte with

cancer immunity and to ascertain if possible the source and nature of the blood lymphocytosis. In the course of the experiments a histologic examination was made of the changes in the subcutaneous tissue in order to check and possibly to extend the earlier observation of Da Fano.

The material for the study was collected in the course of five experiments in which more than 100 mice were used. All the mice were of about the same size and from the same stock. The virulence of the tumors transplanted in each experiment was tested by inoculation into a number of normal mice. The fixative for tissues was Conroy's 6-3-1 and the staining was done with Heidenhain's iron-haematoxylin for mitotic figures and eosin-methylene blue for other general purposes. In most instances loose connective tissue from the subcutaneous layer was carefully spread over the slide, fixed with absolute alcohol, and stained with methylene blue and eosin. Blood films were treated with Wright's stain.

Mice immunized against cancer by an injection of defibrinated blood showed a marked increase in the number of mitotic figures in the germinal centers of the lymphoid organs. The increase became evident forty-eight hours after the injection in the majority of instances, and reached its climax at about the fifth day. After this time it subsided, returning to the normal rate about the tenth day.

The immunized animals when inoculated with a cancer graft ten days after the injection showed a second stimulation of the lymphoid centers similar to the first but more intense. This increase in the number of mitotic figures became evident as early as twenty-four hours after the cancer inoculation and persisted in a marked degree for a week, after which there was a gradual return to the normal rate.

During the establishment of the immunity the lymphocytes of the circulating blood showed frequent instances of amitotic division and many examples of irregular and lobulated nuclei, changes which suggested intensified functional activity.

Contrary to the statement of Da Fano, cellular reaction in the subcutaneous tissues of immunized animals was present only in the region infiltrated by the injected cells. This fact became conspicuous when the immunizing injection was given intraperitoneally. In such cases no cellular accumulations were observed in the loose connective tissue.

Constant cellular changes were not noted in the bone marrow, the thymus, the thyroid, the liver, or the kidneys of the animals treated. G. E. BEILBY.

Zunz, E., and Govaerts, P.: Experimental Research on the Effects of Transfusion in the Different States of Circulatory Collapse (*Ricerches expérimentales sur les effets de la transfusion dans les divers états de collapsus circulatoires*). *Bull. Acad. roy. de méd. de Belg.*, 1919, xxix, 796.

Circulatory collapse following hæmorrhage can be brought about experimentally in the dog by arterial bleeding of four-tenths to six-tenths of the total

quantity of blood in the body. This collapse is characterized by a residual arterial pressure below 50 mm. of mercury, a diminution in the hæmoglobin and the number of red corpuscles, and a lowering of the blood viscosity. The low arterial pressure is accompanied by an elevation in the venous pressure.

The effects of transfusion are very favorable. The arterial pressure returns to its initial level even if the collapse has lasted several hours. It is essential, however, that the transfusion should be slow as otherwise, though the arterial pressure rises during the injection of the blood, it soon falls and the fall may be very decided.

A progressive decrease in the arterial pressure of the dog can be brought also by intramuscular injections of cultures of different anaerobes. In from four to six hours the pressure may fall to 50 mm. of mercury. At the same time the hæmoglobin content, the number of red corpuscles, and the viscosity of the blood increase. The venous pressure is low. The syndrome of circulatory collapse due to infection is thus quite different from that following hæmorrhage. Transfusion has only a transitory effect and the arterial pressure temporarily raised soon rapidly descends.

In the absence of hæmorrhage wrenching one of a dog's hind legs causes only a moderate fall in the blood pressure, and it is rare that such a traumatism results in circulatory collapse. The loss of from 15 to 20 per cent of the total amount of blood in addition, however, causes a considerable fall in the arterial pressure and may even result in death although an equal loss in an untraumatized animal would have only a slight and transitory effect. The hæmoglobin, the number of red corpuscles, and the blood viscosity do not undergo appreciable modifications under such circumstances and transfusion has a less favorable result than if the circulatory collapse resulted from serious hæmorrhage only.

All conditions of circulatory deficiency are accompanied by a certain degree of acidosis. This is most intense in the acute anaerobic infections.

W. A. BRENNAN.

Aloi, V.: Experimental Research upon Peritoneal Reactions to Toxins of Tuberculosis (*Ricerche sperimentali sulla reazione peritoneale ai veleni tuberculari*). *Riforma med.*, 1919, xxxv, 802.

The author's experimental research may be divided into two general parts: (1) control experiments for Szècsi's research on the normal peritoneal cells contained in the peritoneal fluid; and (2) investigations to determine the modifications which these cells undergo in various pathologic conditions of the peritoneum with special reference to the influence of tuberculin.

In his conclusions the author confines himself strictly to the field limited by his own experiments on guinea pigs. These conclusions are:

1. The peritoneal fluid of normal guinea pigs is usually very poor in cellular elements. Contrary

to the findings of other investigators, it never contains eosinophiles.

2. If an inert fluid (physiological solution) or a toxin of tuberculosis is injected into the peritoneum of a healthy guinea pig there is always a peritoneal cellular reaction which is not to be considered as a specific reaction to the toxin but rather as the reply of the serosa to the abnormal stimulus represented by the injected fluid. The cellular curve of these peritoneal reactions is characteristic inasmuch as it is represented by the prevalence of polynuclears in the initial ascending phase and by the paucity of mononuclears (large and lymphocyte) in the descending phase.

3. The peritoneal fluid of tuberculous guinea pigs is rich in cells when compared with that of normal animals. Such cells are mostly large and small mononuclears. The peritoneal serosa of tuberculous guinea pigs, however, reacts most intensely to the introduction of fluids (physiological serum or tuberculin) into the peritoneum. In such cases tuberculin causes the most energetic reaction and among the tuberculins that which gives the most marked phenomena from the point of view of cellular reaction is the new tuberculin.

4. Apart from the general phenomena provoked by tuberculin in tuberculous guinea pigs, which may even amount to death, the toxins of tuberculosis provoke intense polynucleosis with a large collection of fluid in the peritoneum, congestion of the serosa, and all the signs of an acute inflammation.

W. A. BRENNAN.

Frank, R. T.: The Influence of Pituitary Extracts on the Genital Tract. *J. Am. M. Ass.*, 1919, lxxiii, 1764.

The author publishes the result of experiments undertaken to determine the effect of the anterior lobe of the pituitary body on the genitalia.

Thirty-five female white rats were fed varying portions of different mixtures of pituitary body for thirty-five consecutive days. The following conclusions were based on the autopsy findings:

1. More extended experiments along these lines will be necessary before stimulation of the sex organs, or at least the female sex organs, can be ascribed to the use of pituitary extracts.

2. The practice of at once applying unconfirmed results obtained in the laboratory to clinical cases is pernicious. In no field has it been done more than in endocrinology and if it continues unchecked, organotherapy will fall into disrepute both in the opinion of the medical profession and in that of the public.

M. H. HOBART.

MacCallum, W. G., Lintz, J., Vermilye, H. N., Leggett, T. H., and Boas, E.: The Effect of Pyloric Obstruction in Relation to Gastric Tetany. *Bull. Johns Hopkin's Hosp.*, 1920, xxxi, 1.

The subject of gastric tetany has long been of interest but none of the theories which have been advanced as to the cause of the condition is satis-

factory. According to one, it is due to desiccation of the tissues, while according to another, it is the result of the absorption of toxic materials from the stagnating contents of the dilated stomach. It is known that if a communication is established between the stomach and the intestine by a gastro-enterostomy so that the contents of the stomach can once more pass into the intestine, the symptoms immediately disappear.

The experiments on animals reported in this article were carried out to determine the nature of the changes produced by the pyloric obstruction.

It was observed in 1909 by MacCallum that when the pylorus was completely obstructed and the stomach frequently washed out, an animal wasted rapidly and died in a few days, usually with violent convulsions which were not precisely of the same character as the twitchings seen in parathyroid tetany.

Even at that time the authors believed that since nothing was absorbed from the stomach and water was given abundantly through the intestine, the older explanations offered for gastric tetany were faulty. The convulsions they attributed to a loss of hydrochloric acid in the gastric juice. Later experiments supported this view and they have since tried to work out the nature of the whole disturbance.

Although from time to time they employed many different methods in the attempt to obstruct the pylorus partially or completely, they finally returned to the simplest, which consisted in cutting through the stomach just above the pylorus and closing it off with sutures so that it became a blind sac on the end of the œsophagus. The pyloric end with the duodenum was then brought into the abdominal wound where it was sutured. Through it food and water were given, but in the later experiments, in order to eliminate all intake of chlorides and to prevent the loss of bile and intestinal contents, this opening was closed except for a tube through which distilled water was introduced. The food which could be given in this way always contained chlorides and when it was given the symptoms following pyloric obstruction appeared only slowly and the animal lived about a week. When nothing but water was given convulsions occurred in about forty-eight hours and death soon followed.

The authors' observations in one series of experiments showed that the stomach continued to lose chlorides for days after the operation. The excretion in the urine tended to decrease day by day. As later it was found that the analysis of the blood plasma showed the changes in the chlorides more directly and more precisely, these determinations were made every day and the stomach washings and excreta were no longer analyzed for chlorides.

Since the chloride lost in the gastric juice was in the form of free hydrochloric acid, it seemed probable that the sodium ion would be retained in the circulating fluids and that the alkali reserve of the blood might be increased. In the next series of

experiments, therefore, the changes in the plasma chlorides, the alkali reserve as determined by Van Slyke's method, and the electrical excitability of the nerves were studied.

In brief, it was found that the recognizable chlorides in the plasma dropped rapidly, especially in cases in which no chlorides were given through the intestinal fistula. The carbon dioxide combining power rose as the chlorides decreased.

These experiments showed that when the pylorus was obstructed so that the acid gastric juice was entirely removed and no chlorides were given in the food, a peculiar condition characterized by convulsions developed. This condition was not the same as that produced by parathyroidectomy. The muscular rigidity with vibrating clonic twitchings and extreme tachypnoea was lacking. In fact, the rather apathetic animal usually lay quiet until seized with a violent generalized convulsion which threw the body into extreme and rigid opisthotonos and was associated with attempts at vomiting and abundant salivation. After this the animal sank into a kind of coma with slow, deep respirations. Rapid respirations of great volume often preceded the onset of the convulsion.

Another series of experiments showed that excessive injections of sodium carbonate or bicarbonate solutions produced practically the same symptoms, twitching, convulsions, opisthotonos, etc., as are produced by the removal of the chlorides. The preponderance of the alkalies over the acids was on a higher plane since there was no loss of acid, but the relations were similar. The alterations of the electrical excitability and those of the alkali reserve were the same in the two cases. In both the increase of excitability was moderate and rather irregular. Sometimes it seemed not to occur, while in other cases it was very definite.

The authors summarize their experimental results as follows:

When the pylorus was obstructed and the gastric juice with its hydrochloric acid was constantly removed, there ensued a decrease in the chlorine of the plasma. Consequently there was an increase in the alkali reserve which became extreme.

In general, the electrical excitability of the nerves was heightened and there were spontaneous twitchings and in most cases violent convulsions which led to death.

All of these phenomena were prevented by constantly furnishing a large supply of chlorides. It was less easy to cure the condition by the administration of chlorides.

The convulsive movements were not exactly like the twitchings of the tetany of parathyroidectomy in which no heightened alkali reserve was found, but were produced by the injection of sodium carbonate or bicarbonate.

Since these convulsions were stopped or prevented by sodium chloride, the problem as to the fate of excessive base sodium and the specific need for the chlorine ion remains unsolved. G. E. BEILBY.

Albee, F. H.: *Studies in Bone Growth.* *Ann. Surg.*, 1920, lxxi, 32.

The author studied the osteogenic effect produced by the injection of a 5 per cent solution of triple calcium phosphate between the ends of broken bones and under the periosteum of normal bone. A fragment of bone was removed and 1 c. c. of a 5 per cent solution of triple calcium phosphate in distilled water which had been sterilized for three days at 60 degrees C was injected.

Cases of fracture with loss of substance showed much more rapid bone growth and union when triple calcium phosphate was injected into the gap between the bone ends than the controls.

Callus formation in cases of fracture treated with triple calcium phosphate extended far into the soft parts, apparently following the penetration of the solution.

The average length of time necessary for union in cases of fracture treated with triple calcium phosphate was thirty-one days while the corresponding period in the controls was forty-two days.

In the total series cases of fracture treated with triple calcium phosphate showed union eleven days earlier than the controls. The average number of days elapsing between the date of the injection of the solution and the first radiographic evidence of union was nineteen days.

No appreciable bone growth was stimulated by an injection of triple calcium phosphate beneath the periosteum of the bone in cases in which the bone was not fractured.

From these results it was evident that osteogenesis was stimulated by triple calcium phosphate in cases of fracture or, in other words, when there was trauma of sufficiently great severity to open up bone surfaces containing active bone-growing cells — the periosteum, the compact bone endosteum, and the marrow — and thereby allow the solution to come into intimate contact with these layers.

No toxic symptoms were noted in any of the cases treated with triple calcium phosphate and at no time did the solution act as a local irritant.

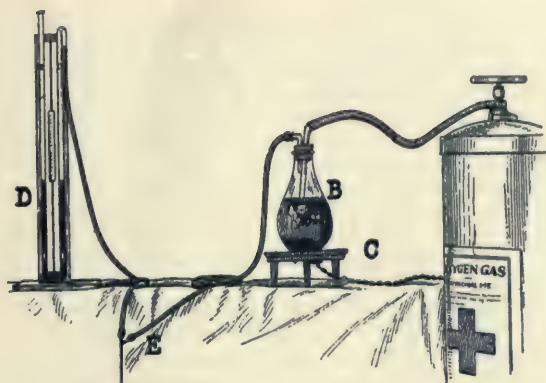
H. A. MCKNIGHT.

ROENTGENOLOGY AND RADIUM THERAPY

Hyman, A. S.: *Radiography in Artificial Pneumoperitoneum.* *Med. Rec.*, 1920, xcvi, 100.

According to the author, Kelling in 1902 was the first to note that gas introduced into the peritoneal cavity would render visible under the X-ray the contour and size of the solid abdominal viscera.

The usual method of procedure has been to inject the oxygen from an oxygen tank connected with an aspirating needle by a rubber tube. Hyman states that in some of the earlier cases in which he used this simple technique, the signs of a low-grade peritonitis developed. This led him to make a bacteriological study of the gas. He found that staphylococci and streptococci were present in 60 per cent of the specimens delivered in this manner.



A. Commercial oxygen-gas tank. B. Flask containing liquid petrolatum heated in a flask to just below the boiling point. C. Electric hot-plate. D. Manometer. E. Injecting needle.

Accordingly, he advises filtering the oxygen through liquid petrolatum heated in a flask to just below the boiling point (590 degrees F.). The temperature may be maintained by placing the flask on an electric hot-plate. The gas is then injected at a temperature between 95 and 110 degrees F. Without this precaution the author found that, due its expansion, it became cooled so that at times it reached a temperature of 27 degrees F. If injected at this temperature, it might cause shock and collapse.

The normal intra-abdominal pressure varies from a negative pressure of 25 mm. of water at the end of expiration to a positive pressure of 10 mm. at the end of inspiration. When the patient strains, the pressure increases to 200 or 250 mm. of water. In the quantity of gas he injects Hyman is guided by pressure rather than by volume. The optimum pressure he believes is 200 mm. of water. In small subjects this pressure will be obtained by a liter or so of the gas, while in large patients from 7 to 8 liters will be necessary. The pressure is controlled by a manometer.

During the injection the patient lies on his back. In order that the gas may reach every portion of the peritoneal cavity after the injection is completed, he is told to assume first a knee-chest position and then the prone position. The oxygen is absorbed in about twenty-four hours.

The author advocates pneumoperitoneum in all obscure conditions involving the liver, spleen, kidneys, and uterus. The best conditions for its use are those in which ascites is a complication. In such cases the gas may be injected through the paracentesis opening.

Hyman has not obtained good results from the use of pneumoperitoneum synchronously with the ingestion of an opaque meal, but he advises giving the barium meal first, and then injecting the gas after thorough catharsis. The results of the two procedures may then be reviewed together and will supplement each other.

R. B. BETTMAN.

Weld, E. H.: The Toxicity of Pyelographic Media; Report of a Death Following the Use of Thorium Nitrate. *J. Urol.*, 1919, iii, 415.

A death following pyelography for which a solution of thorium nitrate was used led the author to make a study of the toxicity of the different media used for pyelography. A detailed clinical history of the fatal case is given, together with the necropsy findings.

Physiological tests of the toxicity of a 25 per cent solution of sodium bromide, a 25 per cent solution of potassium iodide, and a 15 per cent solution of thorium nitrate were made. These were injected into the femoral veins of dogs, after which the carotid blood pressure was noted. The intravenous injection of sodium bromide into four different dogs produced practically no effect even when 55 c.c. were given. Usually there was a slight increase in the blood pressure, but this was due possibly to an increase in the fluid volume.

The injection of 2 or 3 c.c. of a 25 per cent solution of potassium iodide caused the blood pressure to drop to zero and was followed by almost instantaneous death. When 50 c.c. of a 25 per cent solution of sodium iodide were used there was a very slight reaction from which the animal soon recovered. The toxicity of the 15 per cent solutions of thorium nitrate seemed to vary with the different ages of the solutions. Twenty-two cubic centimeters from Bottle A caused death; 10 c.c. from Bottle B caused a decided reaction which was noted in the blood-pressure curve; 100 c.c. from Bottle C produced no apparent reaction; 50 c.c. from Bottle D caused death; and 40 c.c. from Bottle E caused death. The solution in Bottle A was approximately one year old; that in Bottle B, approximately two months old; and that in Bottles C, D, and E had just been received from the manufacturers.

From his experimental research and clinical experience the author draws the following conclusions:

Potassium iodide should be used with great care as a medium for pyelography because of its toxicity and the fact that it is readily absorbed from the renal pelvis. Death following the use of potassium iodide is due very evidently to the potassium radicle since sodium iodide has very little effect.

That the heart muscle is affected by the toxic action of thorium nitrate is shown by the fact that cardiac failure follows the administration of thorium nitrate even after section of the vagi and the administration of such drugs as nicotine and atropine. Thorium nitrate seems to vary in toxicity according to the age of the solution, possibly because of the conditions under which it is kept.

Unfortunately, the 20 or 25 per cent solution of sodium or potassium iodide originally recommended often causes considerable local irritation when used in the renal pelvis and the bladder of man.

Sodium bromide is non-toxic, cheap, easily prepared, readily accessible, non-irritating, and appar-

ently the best medium yet brought forward. A 20 per cent solution is advisable for pyelography, while a 10 or 15 per cent solution is sufficient for cystography. The drug should be chemically pure and the solution sterilized by boiling before it is used.

The protocols of the experiments made are appended in detail.

ADOLPH HARTUNG.

Lee, J. M.: Radiosurgical Therapy. *J. Am. Inst. Homœop.*, 1919, xii, 627.

This paper is made up almost entirely of a description of the author's cases which responded to the application of radium. The details of the technique are not given. While there are several references to the amount of radium used, the exact dosage is not reported. The interesting statement is made that the cost of the radium used exceeded that of the hospital buildings and other equipment.

Favorable results were noted in sarcoma, cancer of the corpus of the uterus, cancer of the uterine cervix, carcinoma of the lip, and carcinoma of the breast. Unusual results were obtained in tumors of the accessory sinuses, especially of the antrum of Highmore. A case of deciduoma malignum is reported in detail.

The article is illustrated with cuts made from microphotographs of sections of extirpated uteri. These cases show degeneration of the mucosa and muscle fibers and the absence of malignancy. All of the changes were observed one month after the application of radium.

W. A. EVANS.

Wood, F. C., and Prime, F.: The Lethal Dose of Roentgen Rays for Cancer Cells. *J. Am. M. Ass.*, 1920, lxxiv, 308.

The exact quantity of X-ray treatment necessary to kill a cancer cell has not been determined heretofore. Knowledge of such a dose, however, is a fundamental condition for the intelligent treatment of malignant tumors with the X-ray.

The authors made this determination in mouse tumors of high virulence and very constant type of growth. When using 85 kilovolts, 5 ma. of current through the tube, at 23 cm. distance, and a 3 mm. aluminum filter, they found that six erythema doses of X-ray were required to kill the cells of a mouse sarcoma. Carcinoma requires about 20 per cent more exposure than is necessary for sarcoma of a connective-tissue type. Lymphosarcoma is much more susceptible to the rays as are also the basal-cell epitheliomata. These figures represent the minimum dosage for a tumor on the surface of the body.

At a depth of 2 cm., 19 per cent more X-ray is required; at a depth of 5 cm., 47 per cent more; and at a depth of 10 cm., 65 per cent more. In other words, it is impossible to kill all the cells of a tumor lying 7 cm. below the surface without exposing the patient to some fourteen erythema doses at a single sitting. This is manifestly impossible as he

would probably not survive such an extraordinary amount of radiation. Just how long an exposure can be given depends upon the patient's resistance, the amount of cachexia, and the position of the tumor. Only in rare instances is it possible to give a killing dose to a new growth in a human being. If a tumor is more susceptible than a rapidly growing carcinoma or sarcoma it will be within the reach of cure; otherwise, the best that can be hoped for is the destruction of a certain portion of the growth so as to keep it under control for a certain period of time.

Normal connective-tissue cells when rapidly growing require about the same dose as that required by sarcoma cells. Hence the difference in susceptibility of tumors and of normal tissues which has been noted is in many instances dependent only on the growth rate and not on a specific differential sensitiveness of the tumor. One-fourth of the dose of X-ray given for four times the usual exposure is just as effective as the full dose.

INDUSTRIAL SURGERY

Sever, J. W.: Disability Following Back Injuries. *J. Orthop. Surg.*, 1919, i, 657, 743.

The author calls attention to the unnecessarily long periods of disability following injuries to the back and concludes that they are often due to inadequate care due to improper diagnosis.

The 134 cases reported were referred to Sever as an impartial examiner. The average length of disability was eight months; that is, eight months elapsed between the accident and the time he made the first examination. In a number of instances the patient had been working some time before the examination and this would, of course, reduce the time of actual disability.

The causes of the injuries were: (1) falls, 61 cases; (2) direct violence to the back, 31 cases; and (3) lifting, 42 cases. In the first two groups there were 31 fractures, many of which were not recognized for some time.

The author analyzes the treatment given, classing it as adequate in 40 cases and inadequate in 55 cases. Thirty-nine patients received either no treatment or treatment that was poor.

From the detailed table of cases it would appear that the periods of disability were shorter when the treatment was inadequate than when it was adequate. This is accounted for, however, by the fact that, as stated, the term "period of disability" means merely the period between the time of the accident and the time of the examination. Naturally the cases adequately cared for would not be seen so early by an impartial examiner for the adjustment of claims.

Reference is made to the mental element in these cases. In the records of 18 cases in Class 2 in which the spine was fractured is some such note as "no disability," "traumatic hysteria," "no disability; disinclined to work."

The author discusses also the relation of hypertrophic arthritis to injury of the spine and states that industrial boards in general are of the opinion that hypertrophic arthritis may be aggravated by spinal injury. Another subject considered is the treatment of fracture of the spine.

BEVERIDGE MOORE.

HOSPITALS; MEDICAL EDUCATION AND HISTORY

Gibson, C. L.: An Analysis of the Results of Six Years' Follow-Up System in a Hospital Surgical Service. *Ann. Surg.*, 1919, lxx, 661.

This paper records an exhaustive study of the end-results of more than 7,000 operations. Most of the patients were told to return three months after operation, were written to for information, or were followed up by a social service department. The results were classified as good, average, and bad.

The conditions in which operation gave good results were malformations; varicose veins; hypertrophy of the tonsils; hæmorrhoids; tuberculosis of the kidneys (15 cases with not a single death and most gratifying results); acute appendicitis (782

cases with 34 deaths which probably were due to the fact that treatment was delayed); herniæ (femoral, 53 cases, 1 death; inguinal, 847 cases, 2 deaths); extra-uterine pregnancy (51 cases, 2 deaths); chronic salpingitis (211 cases, 5 deaths); benign tumors of the breast and uterus; nephrolithiasis; abscess of the kidney; and fractures.

Average results were obtained in cholelithiasis and cholecystitis (179 operations, 12 deaths; cholecystectomy the operation of choice); pancreatitis (6 recoveries, 3 deaths); exophthalmic goiter; strangulated inguinal hernia (41 cases, 6 deaths); umbilical herniæ (74 cases, 12 deaths); tuberculous peritonitis; acute salpingitis (operation in these cases, however, is not recommended); and displacements of the uterus.

Poor results were obtained in ulcer of the stomach and duodenum (8.5 per cent mortality; the author believes that gastro-enterostomy is the method of choice); cirrhosis of the liver (5 cases, 3 deaths); chronic appendicitis (30 per cent of 552 operations gave unsatisfactory results); typhoid perforation (all of the patients died); tuberculous adenitis; prostatic hypertrophy; and malignant tumors.

LOUIS HANDELMAN.

GYNECOLOGY

UTERUS

Coudert, E.: Uterine Sterility and Its Treatment (Sur la stérilité utérine et son traitement). *J. de méd. et chir. prat.*, 1919, xc, 903.

In uterine sterility the principal rôle is played by infection, especially gonorrhœal infection. The gonococcus is the agent responsible in at least half of the cases for the anatomical disorders preventing conception, and this fact should be borne in mind by the practitioner when consulted by a woman regarding sterility. The importance of flexions, deviation, kinks, and stenosis has been greatly exaggerated as such disorders are infinitely less harmful than gonorrhœal infections, and the sterility in such cases is due rather to the concomitant inflammatory metritis than to the mechanical defects.

Well-applied medical treatment gives far better results than are obtained from the numerous corrective surgical operations done with little or no indications, but no formal assurance should be given the sterile woman that conception will be possible after any form of treatment. The antiseptic vaginal injections which most women believe necessary after coitus should be discontinued and warm alkaline injections should be used before coitus. General hygienic measures with special attention to such conditions as arthritis or anæmia, and opotherapy, if indicated, should form the basis of the treatment. Resort should be had to artificial impregnation only when all other measures have failed.

W. A. BRENNAN.

Gilberti, P.: The Surgical Treatment of Uterine Displacements and Genital Prolapse (Osservazioni a contributo del trattamento chirurgico delle deviazioni dell'utero e del prolasso genitale). *Polislin.*, Roma, 1919, xxvi, sez. chir., 288.

In Gilberti's opinion surgical measures constitute the only rational treatment of uterine deviation and genital prolapse. The use of the pessary should be absolutely discarded.

Uterine deviation he treats by ventrofixation according to the method of Olshausen.

In cases of prolapse four different types may be distinguished each of which requires a different type of treatment.

1. False prolapse due to simple hypertrophic elongation of the inferior and subvaginal portion of the cervix. Treatment: Amputation of the cervix according to the Simon method.

2. Vaginal prolapse. Treatment: Anterior colporrhaphy and colpoperineoplasty according to Hegar's technique.

3. Vaginal and uterine prolapse. Treatment: The Proust colpoperineoplasty and hysteropexy or

the Schwartz hysteropexy alone if there are no perineal lesions.

4. Complete and chronic descent of the vagina and uterus. Treatment: Vaginal hysterectomy.

In executing the Proust colpoperineoplasty and hysteropexy an interval of twenty days should elapse between the two operations. The Schwartz method of hysteropexy, although very complicated, is very beneficial and though not so simple and rapid as Olshausen's method, is more certain in its results. It has also had the added advantage in the fact that it permits subsequent pregnancies.

W. A. BRENNAN.

Luque: The Surgical Treatment of Prolapse of the Uterus and Wertheim's New Method (El tratamiento quirúrgico del prolapso uterino y el nuevo procedimiento de Wertheim). *Med. Ibera*, 1919, iii, 97.

The fact that the surgical procedures proposed for the treatment of prolapse of the uterus are almost innumerable is proof that the results obtained are unsatisfactory.

A number of the operations deal with supporting agents, some with the uterus itself, but the greatest number with the urogenital diaphragm. From this fact may be deduced the great importance of the perineum as an etiological factor in the descent of the uterus. Total extirpation of the uterus the author rejects entirely, but the partial hysterectomy of Landau he believes has given excellent results. The most simple procedure in cases which are not severe is anterior colporrhaphy followed by colpoperinorrhaphy. If the descent of the uterus is at all pronounced however, more complicated procedures must be employed. Among these the author mentions the Alquist-Alexander-Adams operation, abdominal hysteropexy, and vaginohysteropexy. He makes special mention of the abdominal hysteropexy of Rumm which is valuable in cases in which pregnancy is a possibility.

In many cases of prolapse of the uterus in which the cervix has become elongated the cervix has been amputated to diminish the weight. The results have generally been unsatisfactory, however, because the weight of the cervix is of no consequence in comparison with the force represented by the abdominal pressure which is the real element to be considered in this condition.

Another group of procedures utilize the uterus itself as a tampon for the "hiatus genitalis." This corrects the displacement of the uterus and prevents the formation of a new prolapse by reinforcing the perineal floor. Occlusion procedures similar to Freud's are those of Fritsch, Schauta, and Wertheim. The last two are much alike and by their

ample luxation of the uterus prevent a recurrence of cystocele as the bladder rests upon the posterior surface of the uterus and is thus maintained in complete reduction. However, if in these operations the cervix later becomes elongated it takes the direction of the axis of the vagina and the elongation may be so pronounced that the cervix appears between the labia. It is to avoid this sequel that Wertheim has devised his new operation which Luque describes in detail with diagrams illustrating the various steps.

M. M. MATTHIES.

Brady, L.: A Myoma of the Uterus Showing Unusual Degenerative Changes. *Bull. Johns Hopkins Hosp.*, 1920, xxxi, 25.

Brady describes the case of a woman, aged 43, who entered the hospital in May, 1919, with an abdominal tumor. The patient's family and personal history were entirely negative. Menstruation had begun at 16 and the periods lasted from three to five days. There had always been a moderate degree of dysmenorrhœa. During the last ten years this had constantly increased and for six months previous to the patient's admission to the hospital she had had a moderate yellowish vaginal discharge. There had been no history of intermenstrual bleeding, no urinary symptoms, and no loss of weight.

The general physical examination was entirely negative. On pelvic examination, the external genitalia were found to be normal. The urethra contained no pus, but a moderate amount of yellowish vaginal discharge. The cervix was high in the vault, firm, pointed forward, and slightly lacerated. The fundus was about twice the normal size, irregular in outline, and tightly fixed in the pelvis. The adnexa could not be felt. The pre-operative diagnosis was myomata uteri. The uterus, appendix, right tube, and right ovary were removed.

The specimens examined consisted of the right tube and ovary and the uterus to which a large cyst was attached. The tube was 8 cm. long. Around it were many adhesions, but its lumen was patent. On microscopic examination no pathologic changes were observed. The ovary measured 4 by 2 by 1.5 cm. and contained a small hæmorrhagic cyst. The microscopic picture showed a corpus luteum cyst but was otherwise negative. The uterus with the large cyst attached measured 9 by 14 by 6 cm. After the uterine canal was opened the endometrium was seen to have a yellowish tinge. Sections from several portions of the uterus showed a general myomatous condition with considerable variation in the number of cells. Nowhere, however, was there any sign of malignancy. The cyst extending out into the right broad ligament was multilocular, heart-shaped, and of a bluish color. It extended downward from the lower surface of the uterus.

On the inner and lower side of the cyst, about 2 cm. from the external os of the uterus, was an opening about 2 cm. in diameter. A small probe having been introduced into this opening, a definite canal

was dissected out. This tube, which extended upward from the lateral wall of the vagina along the cystic tumor and then upward to the broad ligament, was in exactly the location which would be occupied by the embryonic remains of Gartner's duct. If it was the remains of Gartner's duct, the specimen was especially interesting because here there was an opening of considerable diameter and a tube of uniform caliber, whereas in the majority of such cases reported the opening was much smaller and the lumen of varied size, being dilated in some portions and contracted in others.

The cyst was opened through the anterior mass and a considerable amount of fluid was evacuated. Sections proved the cyst to be a myoma showing degenerative changes. There was marked hyalinization, the hyaline being deposited especially around the blood vessels. In numerous areas only the shadows of smooth muscle could be made out, while in the high-power field only a few deeply stained nuclei were seen. Brady found it hard to convince himself that he was not dealing with embryonic or fully developed cartilage for the heavily stained nuclei occupying clefts resembling lacunae were strongly suggestive of cartilage cells. The clefts and the grouping of the nuclei however, were known to be caused by the contraction of the smooth muscle fibers as they underwent degeneration.

G. E. BEILBY.

Matthews, A. A.: Surgery Versus Radium or the X-Ray in the Treatment of Uterine Fibroids. *Northwest Med.*, 1920, xix, 15.

The author reports the results of 100 consecutive hysterectomies done at St. Luke's Hospital, Spokane, Washington. In 56 cases the operation was performed for fibroids, in 21 for carcinoma, in 10 for prolapsus, in 10 for hæmorrhagic conditions due to causes other than fibroids or cancer, in 2 for hypertrophy of the uterus, and in 1 for uterine abscess. The abscess contained about a pint of pus which had dissected the mucous membrane from the uterus posteriorly and on its upper walls. Before operation it was believed to be a growth. In 29 of the 100 cases other operative work was done at the same time as the hysterectomy.

There were only 3 deaths and all of them occurred in cases of cancer in which a Wertheim hysterectomy was done. Two of the patients died from shock eight and twelve hours following the operation, and the third from suppression of urine. In the case of one of the patients who died from shock it had been necessary to remove the fundus of the bladder and transplant one of the ureters.

Uterine fibroids should be treated by myomectomy rather than by hysterectomy or with radium or the X-ray. When radiotherapy is used in such cases the functions of the uterus are lost and the ovarian function, which it is most important to retain, is destroyed. The roentgen-ray and radium should be considered only in conditions in which there are serious heart, renal, or pulmonary compli-

cations and for extremely weak patients who cannot stand the physical shock of an operation. In all other instances surgery is indicated.

EDWARD L. CORNELL.

Taylor, H. C.: The Treatment of Cancer of the Uterus. *N. York State J. M.*, 1920, xx, 8.

From a study of vital statistics, Taylor estimates that in the State of New York there are annually over 1,100 deaths from cancer of the uterus, that these cases constitute one-quarter of the deaths from cancer among females, that about 1 woman in 32 past the age of 40 dies of cancer of the uterus, and that if a woman becomes a victim of this disease she has about one chance in fifty of escaping death from it.

The treatment of cancer of the uterus is considered under four headings: (1) publicity and education, (2) prophylaxis, (3) treatment of operable cases, and (4) treatment of inoperable cases.

PUBLICITY AND EDUCATION

A few years ago the American Society for the Control of Cancer was organized for the purpose of educating the public regarding cancer in general. It teaches the public that cancer is not contagious, that it is practically not hereditary, and that in many cases it is curable, but only if taken in its early stage.

Specifically in regard to cancer of the uterus, women are taught only that any increase in the menstruation or any change in the discharge, particularly after the age of 35, demands attention from a competent physician and the only way a physician can determine whether or not a malignant condition is present is by direct examination.

There is nothing that would do more to reduce the mortality from cancer of the uterus than to impress upon the women of every community the significance of the two symptoms mentioned and upon physicians their responsibility if they neglect to give to a patient complaining of these symptoms the benefit of proper examination and treatment.

PROPHYLAXIS

It may be strange to speak of the prophylaxis of cancer of the uterus, but the expression is correct as there is no doubt that cancer of the uterus can be prevented. Statistics show that cancer of the cervix is rare in women who have had neither children nor miscarriages, that is, who have had no injury to the cervix. We know from many examples that cancer in other parts of the body is associated with chronic irritation. Cancer frequently develops in a scar that is subject to constant irritation and in an unhealed sore, but is infrequent in a scar that is well healed and is not irritated. These facts approximate the cause of cancer of the cervix and indicate the way in which it may be prevented. The unhealed or eroded cervix should be converted into a healed cervix without erosions, preferably by amputation. A condition of the cervix that would

indicate an operation in a woman of 45 would not necessarily necessitate an operation in a woman of 25.

Most cases of unhealed lacerations or erosions of the cervix cause symptoms, and the local condition of most patients would be improved if these lacerations or erosions were properly repaired. There is, therefore, a double reason for advising operation in every case of disease of the uterine cervix in women who have finished bearing children. The patient will be in better health on account of the cervical repair and the possibility of cancer of the cervix will be greatly diminished. It is easier to prevent cancer of the cervix than to cure it. The cure of a diseased cervix, that is, the removal of a source of constant irritation, is a second and important factor in the reduction of the mortality from cancer of the uterus.

TREATMENT OF OPERABLE CASES

The definition of an operable case of cancer is frequently changed. A few years ago, before radium was in common use, many cases were considered operable that would now be placed in the inoperable class. Formerly it was known that if a case was not operated on there was no hope and therefore surgeons were led to operate in many instances when the chance of cure was comparatively small and the risk of the operation correspondingly great. With the use of radium, a case is not necessarily hopeless without operation, and even if the condition is not permanently cured life may be prolonged and the patient made more comfortable.

The use of radium, however, has developed another class of cases, that is, cases which were inoperable before treatment but as a result of the use of radium have become operable.

In the treatment of operable cases, i. e., cases in which the growth is limited to the uterus with possibly a limited superficial involvement of the vaginal walls, the author believes a combination of radium and operation offers the greatest hope of a permanent cure. It is his custom in such cases to make an application of radium, usually 100 milligrams for twenty-four hours, and then after waiting a week to allow the possible reaction from the radium to subside, to perform such an abdominal hysterectomy as is indicated. If the case is favorable, he does a radical abdominal hysterectomy with isolation of the ureters and removal of the pelvic connective tissue as far as possible. If the case is more difficult on account of a thick abdominal wall or any concurrent constitutional disease, he is satisfied with a simple hysterectomy.

It has been stated that after the use of radium a hysterectomy is more difficult on account of the increased danger of hæmorrhage and the absence of the usual planes of cleavage. In the author's opinion, however, the increased difficulty is not sufficient to contra-indicate an operation. There may be some increased bleeding, but in no case was it hard to control. There is usually some œdema

about the bladder fold and at the bases of the broad ligaments, but this has never interfered materially with the operation in any of the author's cases nor with the subsequent healing of the wound. In one case the application of radium was followed by a marked febrile reaction and the operation was not performed until a month later. It was then done without any great difficulty. Following the operation and previous to the patient's discharge from the hospital at the end of three or four weeks, the author applies radium to the top of the vagina. He has followed this method in 12 cases without one death.

TREATMENT OF INOPERABLE CASES

Some cases of cancer are so advanced when first seen that it would be folly to do anything except give morphine for the relief of pain and discomfort and proper douches for cleanliness. In these cases the possibility of causing irritation to the bladder or rectum is such that the patients are more comfortable without any local application of radium. Excluding these hopeless cases, however, there has been nothing in the author's experience that has produced the favorable results obtained with radium in the treatment of inoperable cancer of the cervix. He prefers it to the cautery because it may be applied without an anæsthetic and with practically no discomfort, it requires but a short stay in the hospital, and its results are often striking.

In some instances the patients apparently cured by the use of radium are in reality not cured. Theoretically, it would seem that some of these might be saved by a hysterectomy. Therefore, if a case is a good operable risk, that is, if there is no constitutional contra-indication and the patient is not too fat, it is the author's custom to do a simple hysterectomy or a modified radical operation.

C. H. DAVIS.

Zimmermann, V. L.: Cautery Methods in the Treatment of Uterine Cancer. *N. York State J. M.*, 1920, XX, 11.

In cases of adenocarcinoma beginning in the cervical canal and causing general enlargement of the portio vaginalis, the author believes that the original high cautery amputation of Byrne will give a much greater percentage of cures than any form of extirpation and will greatly reduce the primary mortality.

The difficult problems of uterine cancer are encountered in the growths in the cervix. Cancer of the body of the uterus is of slow growth and tends to localization and delay in metastasis, while glandular growths near the juncture of the cervix and the body are insidious in their onset, difficult to diagnose early, rapid in their spread to vital organs, and deadly in their metastasis to other viscera.

In deciding upon what constitutes the dividing line between the operable cases and the hopeless conditions in which only palliation is possible great difficulties are encountered. Recently the use of the cautery and heat methods has been placed upon a

more scientific basis by studies of the effects of various degrees of heat upon cancer cells made by Clowes, Loeb, Haaland, Lambert, and others, but the employment of cautery methods at once suggests inoperability and palliation. Although Byrne relieved symptoms and prolonged life in comparative comfort in advanced cases, he has a claim to recognition because of a much more important achievement, i.e., that of devising a distinct curative galvanocautery operation for the early case of cancer of the cervix.

The technique of the Byrne operation can be modified somewhat today by reason of the fact that it is now possible to obtain the electricity from the street current by means of a proper transformer. This does away with the rather untrustworthy battery which took up so much of Byrne's time and experimentation. Suitable specula must be at hand to expose the parts. Water-cooled specula are not applicable to this operation in which a part is removed as they prevent the descent of the uterus. Byrne used an ingenious speculum of his own but it never gave equal satisfaction in other hands. Zimmermann uses the ordinary weighted speculum or a wide Sims speculum held by an assistant. To retract and protect the bladder a Jackson speculum is probably the best. Other suitable retractors should also be at hand to draw away the lateral vaginal walls.

If the vaginal outlet is small a Schuchardt incision may be made to allow a better exposure of the vagina and cervix. In a case of early involvement, the cervix is seized with the diverging volsellum forceps passed well up the cervical canal. The cautery knife is then placed upon the cervix at a short distance from the bladder insertion and the heat applied slowly. Byrne laid great stress upon the necessity for turning the heat on gradually after the knife has been applied cold. The incision is then carried through the mucous membrane all around the cervix, care being taken not to make traction upon the cervix until the knife has penetrated the sub-mucous structures in order that injury to the bladder and rectum may be avoided. It is a mistake to make the incision and attempt to dissect off the bladder as in an ordinary vaginal hysterectomy as this causes free bleeding which defeats the object of the operation. Care must be taken to keep the knife at a dull cherry-red heat for if it becomes too hot free bleeding will take place. More time is required to cut through the tissues with a low heat, but the incision will be bloodless. As soon as the submucous tissue of the cervix is reached, gradual and firm traction is made upon the tenaculum in the canal, the point of the knife being directed inward toward the internal os. In this way, by slowly pressing the cherry-red knife inward, searing well the cut surface with the flat body of the knife and making firm and steady traction upon the grasping forceps, it is possible to complete the amputation well above the level of the internal os, leaving only a part of the body and fundus.

As a result of the application of heat it will be found that the cervix attached to the tenaculum has shrunk from its original size to insignificant proportions. The cavity thus formed should be again gone over with the dome-shaped cautery until it is thoroughly charred and roasted. This very important point was greatly emphasized by Byrne, and Zimmermann agrees with Percy that the good results obtained with the method were probably due as much to this roasting as to the removal of the diseased part. The carbonization prevents the dissemination of heat far enough to destroy the vital tissues of the ureters and bladder, but permits it to extend a sufficient distance to kill any cancer cells present in the parametrium and to seal effectually the cancer-carrying lymphatics.

If the operation has been patiently done with a low degree of heat, it should be bloodless. Frequently in the attempt to make a detour of the cancerous posterior lip the cul-de-sac of Douglas is opened. This need not be a cause for alarm as Zimmermann has never seen any harm come of it. When it occurs, the head of the table should be lowered, the intestines held back with a small laparotomy pad, and the operation continued.

The technique described is applicable to all early cases of uterine cancer but if the uterus has lost its mobility to any great degree, if the cautery knife cannot be inserted outside the bladder line in the cervix on account of the advancement of the disease, the case is not suitable in any way for the Byrne method.

The faults of the operation are these:

In women not beyond the menopause the contraction of the scar following the burning away of the cervix may result in a stenosis causing dysmenorrhœa or hæmatometra. The method has a great disadvantage also in that it destroys the cervix and microscopic examination is therefore impossible. When Byrne published his well-known and remarkable statistics, they at once brought a storm about his head and he was harshly criticised principally on the ground that in most instances his cases lacked microscopic verification of malignancy. His evidence had been destroyed. Shoemaker remarks that the absence of the traumatism necessary to obtain a specimen for preliminary diagnosis was probably a considerable factor in the freedom from recurrence in Byrne's cases.

One of the most consistent believers in the cautery technique in cases of cancer of the uterus was Werder of Pittsburgh. Werder adapted the method of Byrne with the addition of an abdominal hysterectomy by means of Downes' clamps. This is a radical but a comparatively safe operation for cancer of the cervix and was called by its originator "igni-extirpation of the uterus." Werder probably operated upon more cases and presented better statistical results than any advocate of the cautery since Byrne. His method gave such good results in cancer of the cervix that it merits the following brief description:

A high amputation of the cervix is done with a cautery knife according to the method of Byrne, particular attention being paid to roasting the bases of the broad ligaments which must be thoroughly cooked and perfectly dry. Next, the abdomen is opened by a long incision. After the infundibulopelvic and broad ligaments are tied off and the attachments of the bladder to the uterus have been separated, the operation is completed by the use of the electrothermic clamps. These clamps are placed on the broad and sacro-uterine ligaments and the heat is turned on until the tissues between the blades are thoroughly cooked to a thin white ribbon. This is then cut and the remaining supracervical portion of the uterus removed.

The success of Werder's operation Zimmermann considers the best proof of the soundness of Byrne's ideas and due in great measure to the work done on the cervix according to Byrne's original method. Werder's results when he simply severed the vaginal attachments of the cervix with the cautery and removed the uterus and adnexa *en masse* were not so good as he then did not get the thorough roasting and heating of the parametrium at the cervicocorporeal juncture which is obtained by the Byrne technique. Werder himself called attention to the importance of this step which destroys the parametrium, the principal cancer-carrying structure and Wertheim repeatedly stated that it is more important to remove the parametrium than the pelvic lymph glands. So in cautery amputation, or ignihysterectomy, it is of most importance to cook and seal the parametrial tissues at the broad ligament bases. For the upper part of the broad ligaments heat methods are of relatively small value. That an open abdomen insures accuracy during vaginal manipulation is not to be denied, but it adds to the element of shock and increases the danger of peritonitis, both of which the original operation was devised to eliminate.

In the treatment of advanced cases of uterine cancer heat had been used long before Byrne's time. This palliative operation as practised by Byrne has been greatly enlarged in its scope and made more radical in its application by Boldt. According to Boldt's method the cancerous area is removed with a sharp curette, the surface is dried with a styptic pack, the abdominal cavity is opened, and whenever feasible the internal iliac, uterine, and ovarian vessels are ligated. The gauze is then removed from the vagina and cauterization is done through a suitable water-cooled speculum with the cautery point at white heat. The cautery is guided and directed through the open abdomen by either the operator or the assistant. After the eschar has been thrown off and the discharge lessened, a low degree of heat is sometimes applied for a short time.

If this method is used before the patient has become too much weakened by septic absorption and is repeated as frequently as the symptoms demand, Zimmermann believes it will prove as effective in retarding the growth of advanced cancer as the

long-continued application of low heat recommended by Percy, if not more effective. Moreover, the attendant dangers are not so great, either as regards mortality or the formation of fistulae in the ureters, the bladder, or the rectum. C. H. DAVIS.

Heyman, J.: The Results of Radium Treatment of Uterine Cancer (Erfolge der Radium-Behandlung von Gebärmutterkrebs). *XII Versamml. nord. chir. Ver.*, Christiania, 1919, July.

Heyman's report includes cases of uterine carcinoma treated with radium during the year 1914-15 and hence observed for a period of five years.

Twenty-six patients were treated in 1914. In July, 1919, 7 of these were clinically cured, 17 had died of cancer, and 2 had died of some intercurrent disease.

In 1915, 40 patients were treated. Of these, 11 were clinically cured in July, 1919 (1 was cured after a prior radium treatment, but was operated upon later because of recurrence), and the remainder had either died or could not be traced.

The success of the radium treatment—cures amounting to 26.9 per cent after five years—therefore exceeds that of surgical operation which gives an average of absolute cures amounting to 20 per cent.

The large number of recoveries in 1914 and the almost equal number of successful results in 1915 cannot be regarded as a mere coincidence. Of the total number of 66 cases, 85 per cent were inoperable.

W. A. BRENNAN.

Ransohoff, J. L.: Late Results in the Radium Treatment of Cancer of the Uterus. *J. Am. M. Ass.*, 1920, lxxiv, 163.

Nineteen per cent of the patients treated with radium have remained free from recurrence for from two and one-half to five and one-half years; 1 patient for five and one-half years, 2 patients for over four years, 1 patient for three years, and 1 for two and one-half years. In the last case, however, the time which has elapsed since the treatment may be too short to warrant the assumption that a cure has been obtained. This percentage of cure seems small, but it compares favorably with that following operation. Deducting the 8 cases in which the treatment was incomplete raises it to 25 per cent.

Of the remaining 26 patients some have died of the disease, some have a recurrence at the present time, and others cannot be traced.

The author has definitely given up both curettage and cauterization as preliminaries to radium treatment.

If cases were chosen for radium treatment with the same care used when they are chosen for operation, Ransohoff feels confident that the percentage of cures would be very large. This, however, is not the function of the radium workers. Radium workers should give an opportunity for relief to every person who seeks treatment. There is scarcely any case so far advanced that some im-

provement may not be obtained. In this work the observer strives, not for statistics, but to give every patient a chance for at least amelioration of the symptoms.

The results of the 32 cases reported, in which a cure was obtained in 19 per cent, are contrasted with the Jacobson statistics in which the cures amounted to only 11 per cent. Attention is directed also to the fact that there was no fatality in the author's series while in cases treated by the radical operation the mortality reaches 18.25 per cent. In the use of radium the time the patient must remain in the hospital is shortened by weeks and post-operative suffering and its sequelae are avoided. Radium treatment should entirely supplant operation, in the treatment of both inoperable and operable cases of cancer of the cervix.

EDWARD L. CORNELL.

ADNEXAL AND PERI-UTERINE CONDITIONS

Fogt, M.: Hæmatosalpinx Due to Congenital Malformation (L'hématosalpinx par malformation congénitale). *Ann. de gynéc. et d'obst.*, 1919, lxxii, 551.

Hæmatosalpinx due to congenital malformation is a variety of hæmatosalpinx located in a tube of an aberrant rudimentary uterus. The malformation has two principal characteristics: (1) a unicornate uterus; (2) a uterine cornua representing a müllerian duct which was arrested in its development. The uterus is usually normal except for the lack of one horn. Therefore in such cases a normal fallopian tube is attached to an aberrant uterine cornua.

Among the conditions which may be associated with such an aberrant uterus is hæmatometra and voluminous hæmatosalpinx. A search of the literature over a period of more than forty years reveals only 55 cases, and in only 14 of these was the hæmatosalpinx sufficiently marked to form the principal tumor.

The author gives the clinical histories of 2 recent cases, one of which he treated himself.

The various findings reported in the literature regarding cases of this type are summed up as follows:

1. Examination by palpation or vaginal and rectal exploration does not reveal the nature and situation of the pelvic tumor.

2. The statistics given by the literature (1876-1919) show 55 cases of rudimentary accessory uterus in which the condition was discovered by clinical examination. In 13 cases there was a voluminous hæmatosalpinx; in 31 cases, hæmatometra without appreciable hæmatosalpinx; and in 3 cases, pyosalpinx with hæmatometra.

3. The condition is rarely diagnosed clinically and a laparotomy is done for a pelvic tumor believed to be uterine or adnexal.

The treatment consists in ablation of the hæmatosalpinx, the corresponding ovary, and the rudi-

mentary uterus. The normal uterus and appendages should be preserved.

In the author's opinion the cause of the anatomical anomaly is coalescence of the two müllerian ducts which normally form the uterus. The hæmatosalpinx is formed by the accumulation in the tube of the menstrual blood from the mucosa of the rudimentary horn.

W. A. BRENNAN.

Cantoni, V.: Some Inflammatory Adnexopelvic Lesions Due to Influenza (Di talune lesioni infiammatorie annessio-pelviche da influenza). *Ann. di ostet. e ginec.*, 1919, xl, 217.

The author reports 12 cases of adnexopelvic disease following influenza which he observed among many cases of disturbances of the genito-urinary tract following the epidemic of 1918-19. The clinical histories of these cases did not reveal any cause other than the influenza. The diagnosis was either adnexitis or pelvic peritonitis. In 7 cases there had been a prior bronchopneumonia, and in the remaining 5, a diffuse bronchitis.

In 2 cases the adnexitis was slight. In the others it was more severe, in some instances a decided tumefaction being present. In 3 cases the process had penetrated the pelvic serosa and set up a pelvic peritonitis.

The author recalls that following the epidemic of 1890 Gottschalk reported similar cases. He is confident that in his own there was a distinct relation between the influenza and the genital lesions as up to the time of the epidemic the patients had been in perfect health.

In 3 of the cases a bacteriological examination was made of material obtained by puncture. Numerous diplococci identified as Fraenkel's diplococcus were found. Certain bacterial forms which did not take the stain well could not be identified. The discovery of the Fraenkel diplococcus suggests that the same bacterium which caused the pulmonary congestion later exerted its action on the genital tract. The adnexopelvic lesions, therefore, may be classed as secondary.

W. A. BRENNAN.

Graves, W. P.: Ovarian Residue. *Surg., Gynec. & Obst.*, 1919, xxix, 537.

The author describes ovarian residue as that part of the ovary which remains after the ablation of the corpus luteum. Its use as a therapeutic agent has a logical basis in the fact that the theca luteal cells which become activated in the physiological process of follicular atresia correspond to the segregated cells of the interstitial gland found in certain animals. These cells and the luteal cells of the corpus luteum are apparently derived from the same source.

The cases treated by the author with ovarian residue he divides into three groups: (1) those in which there were symptoms of a natural or artificial menopause; (2) symptoms of menstrual disturbances such as amenorrhœa, oligomenorrhœa, delayed

menses, and clotting; and (3) cases of essential dysmenorrhœa.

In the first group the treatment was beneficial in 78 per cent of the cases. In the second group there were failures, especially the cases of long-standing amenorrhœa, but in some instances of delayed menses and clotting the results were striking. Even when it was impossible to re-establish the menstrual rhythm, however, the patients spoke of the stimulating effect of the treatment, and this effect could be increased by the addition of thyroid and anterior-lobe extracts. The records of the third group of cases are still incomplete but the results obtained so far seem to indicate that the treatment has a definite value.

The author draws the following conclusions:

1. Ovarian secretion is not confined solely to the corpus luteum.

2. The secretion of the atretic follicles is similar to that of the corpus luteum, being produced by analogous cells, i.e., those proliferated from the internal theca.

3. The ovarian residue preserves its chemical integrity longer than ovarian preparations which contain corpus luteum substance.

4. Under present conditions of preparation ovarian residue is in general superior in its clinical results to the commercial products now on the market.

S. A. CHALFANT.

MISCELLANEOUS

Meyer, W. H.: Roentgen Therapy in Gynecology. *N. York M. J.*, 1920, cxi, 143.

Living tissues may be stimulated, inhibited, or destroyed by radiation, and on account of differences in the radiosensitivity of cellular structures the three effects may be produced in the same area.

The possibility of curing superficial malignancy by radiant energy is generally conceded. Since the absorption rate has been used as a basis of dose measurement the author has treated over 50 cases of superficial malignancy with satisfactory results. He varies the penetration and filtration to suit the individual case, the dose factor being always the estimated absorption. Results are produced in a single sitting with a maximum duration of fifteen minutes. In lesions more than 1 cm. in depth the probability of cure speedily diminishes as the depth increases. "Complete resolution is to be expected only if a lesion is so situated that the dose known to be destructive to the particular type of cell can by multiple cross fire be brought to bear."

In deep-seated malignancy the best effects that can be obtained are inhibition of the malignant cells and stimulation of the surrounding normal tissue.

In menorrhagia, metrorrhagia, symptoms of the menopause, and uterine fibroids, a single treatment of from forty to ninety minutes' duration stops the menstrual function. Large fibroids may require three or more treatments from four to six weeks

apart. For subperitoneal myomata the author advises surgery. Radiotherapy is contra-indicated also in cases of submucous myomata. The intramural type are best suited to irradiation.

M. J. GELPI.

Sunde: Malignant Chorio-Epithelioma (Ueber chorio-epithelioma malignum). *XII Versamml. nord. chir. Ver.*, Christiania, 1919, July.

The author's report is based upon 38 cases of chorio-epithelioma treated by operation.

Twelve of the 38 patients recovered and 26 died. In 10 of the fatal cases the chorio-epithelioma appeared after a hydatid mole; in 7, after a miscarriage; in 8, after a normal birth; and in 1, after an extra-uterine pregnancy. In the 12 cases of recovery the tumor developed in 11 after a hydatid mole, and in 1 after a miscarriage.

In the cases in which there were irregular hæmorrhages due to a hydatid mole the diagnosis was made much earlier than in the cases of miscarriage or normal birth. The former therefore came to operation sooner, a fact which was of great importance because of the rapid growth of the tumors.

As representing the more rare types of chorio-epithelioma the author mentions a case in which the tumor developed in the ovary following an ovarian pregnancy and 3 cases of "ectopic" chorio-epithelioma in 1 of which the growth was in the brain and in 2 of which it occurred in the connective tissue surrounding the vagina.

In 2 cases in which the microscopic diagnosis following curettage was chorio-epithelioma no tumor could be found when the uterus was removed. One of these patients recovered but the other died from extensive metastases.

W. A. BRENNAN.

Barragán y Bonet, M.: Cystitis Due to Utero-Adnexal Causes and Its Treatment (Las cistitis por causas utero-anexiales y su tratamiento). *Med. Ibera*, 1919, iii, 57.

The female genital tract and the bladder are under the same roof, the peritoneum; they rest on the same floor, the perineum; their chambers are in intimate contact at one of their surfaces; they are nourished from the same sources; and the spinal and sympathetic nerve supply is common to both. It is not strange, therefore, that their pathologic changes should be related. Everything is admirably disposed for affections of the uterus and its adnexa to exert an influence on the bladder. In addition, the ureter, which is in contact with the uterine cervix, is affected by pregnancy and tumors in the uterus and adnexa.

The author classifies this pathologic action of the uterus and its adnexa on the urinary tract as reflex action, mechanical action, and infection.

Reflex action: The genital tract influences the urinary tract even normally. The reaction of the bladder to the active congestion of menstruation and the passive congestion of the menopause is represented by vesical excitation and a predisposition

to infection. Genital neuropathies in women are often manifested by vesical pain and frequency of micturition. Other uterine disturbances may act upon the contractility or sensibility of the bladder and cause pollakiuria, pain, retention, or incontinence. Pollakiuria and pain are nearly always associated and are observed in cases of metritis with displacement, salpingitis, salpingo-oöphoritis, prolapse, cystocele, etc. While true retention or true incontinence may be observed in cases in which there is no lesion of the urinary tract and no mechanical influence, this is exceptional.

Mechanical action: Generally the functional disturbances of the bladder are due to mechanical influences and their character varies according to whether the action is on the bladder, the urethra, or the ureter. Genital prolapse, elongation of the uterine cervix, and the various tumors of the genital tract all tend to act mechanically upon the urinary tract.

Infections: Vesical infection, which is more important than either reflex or mechanical action, is due most frequently to the passage of the infecting agents from the organs of the pelvic cavity to the urinary tract. Practically all forms of cystitis are produced by bacterial infection, though the condition does not always develop upon the introduction of bacteria into the bladder. A considerable number of bacteria may be found in the urine in the absence of vesical infection. At least three factors are necessary: the bacteria, a suitable field for their growth, and a route by which they may reach this field.

The bacteria which most frequently cause cystitis are the staphylococci, the diplococcus ureæ, the colon bacillus, and the urobacillus. These bacteria attack the vesical mucosa and are able to infect it in the absence of ammoniacal fermentation. Ammoniuria is only a transitory factor of urinary infection.

The bacteria may reach the bladder by several different routes: through the urethra, the circulation, the lymphatics, or the vesical walls.

Staphylococci, diplococci, and, rarely the colon bacillus are found in the urethra normally. Septic catheterization will produce a urethrocystitis while aseptic catheterization may produce cystitis by carrying bacteria from the urethra into the bladder. Spontaneous cystitis may develop from the urethra without the passage of an instrument as the female urethra is relatively short and straight.

Typhoid bacilli, pneumococci, colon bacilli, influenza bacilli, etc. brought to the kidney and bladder by the circulation may cause nephritis and cystitis.

Salpingitis, salpingo-oöphoritis, pericystitis, and all the infections of the pelvic peritoneum may be complicated by cystitis due to the passage of the bacteria through the bladder wall. The organisms may give rise to a local point of infection or, when mixed with the urine, to a generalized cystitis.

Before the development of cystitis, however, the vesical mucosa must be in a condition to receive the bacteria and furnish them with a suitable field for their development. In other words, the defense of

the epithelial layers must be reduced. Normally, the flora of the urethra and vagina are very slightly virulent, but under the influence of trauma, congestion, or retention their virulence increases and the resistance of the field is lessened.

Trauma, whether it is mechanical, chemical, or thermal, always induces cystitis. Cystitis due to calculi and that following surgical operations or parturition are examples of the condition so produced. The influence of congestion is very apparent during the menstrual periods and pregnancy. Retention alone does not cause cystitis but the condition will develop if there are pathogenic organisms in the retained urine.

The diagnosis of cystitis depends upon the simultaneous presence of three principal symptoms: frequency of urination, pain, and pyuria.

Preventive treatment of cystitis consists in disinfecting the routes for the passage of exploratory instruments and the instruments themselves with the utmost care and attending to even the slightest pelvic infection.

In the medical treatment the drugs to be taken by mouth which are derived from formol are not so active as those derived from salicylic acid. Irrigations carefully performed arrest the exudation and may have a bactericidal action. To calm the vesical irritation, belladonna, opium derivatives, or urotropine may be given.

In the surgical treatment the use of a permanent sound has been of value in cases of chronic cystitis in which the irritability of the bladder and the frequency of urination allowed the patient little rest. Instillations of 3 or 4 c.c. of a solution of gomenol and antipyrine always give great relief and in some cases effect a cure.

When in cases in which the urine is macroscopically clear cystoscopy shows intense congestion of the trigone and neck of the bladder and the catheter,

on reaching the neck, produces intense pain, the urethra may be dilated safely but this must be done gradually. The condition will be improved after the fourth or fifth treatment, and in the majority of cases a cure will result.

The article contains also a detailed description of the various methods of doing a cystotomy.

M. M. MATTHIES.

Turenne, A.: Temporary Sterilization of the Female. *Surg. Gynec. Obst.*, 1919, xxix, 577.

Every procedure for temporary sterilization should meet the following requirements:

1. It should be easy to execute.
2. It should reduce the danger to life to a minimum.
3. It should not produce degenerative lesions of the ovary.
4. It should not modify substantially the nutrition, the topography, or the functioning power of the different segments of the genital tract.
5. It should permit the re-establishment of cervico-ovarian communication.

The author's operation is done with the patient under general anæsthesia and in the Trendelenburg position. The Pfannestiel incision is used. The broad ligament is held with two hooked forceps in such a way that its anterior surface is well exposed. A 15 or 20 mm. incision is then made in its anterior layer, 10 or 15 mm. from the lower tubal border and near the ostium. The edges of the incision are separated, and in the cellular space between the two layers of the ligament a small pocket is hollowed out to hold the tubal ostium. The tube is inserted here and sutured, and for greater security is fixed to the ligament at another point nearby. The organ retains sufficient mobility, is not violently kinked, and is not subject to any disturbance of the circulation.

EDWARD L. CORNELL.

OBSTETRICS

LABOR AND ITS COMPLICATIONS

Lochrane, C. D.: The Significance of the Position of a "Contraction Ring" in Cases of Extreme Pelvic Contraction with Vertex Presentation. *Brit. M. J.*, 1920, i. 11.

The author discusses the ring of Bandl which may form in protracted labor due to contracted pelvis with vertex presentation. He takes the view that this ring is probably a true contraction ring and not due to the formation of a uterine segment.

A serious proposition is encountered when such a condition develops. Two cases are cited, one of which the author treated personally, and the other one in which he observed the treatment. The situation is difficult because of the formation of the ring around the neck of the fetus, the head being still above the brim. In most cases there has been much attempt at manipulation, the woman's condition is usually grave, and the fetus is dead.

Five lines of treatment are considered: (1) craniotomy alone; (2) craniotomy with embryulcia; (3) cesarean section alone; (4) cesarean section after craniotomy; and (5) cesarean section after craniotomy and decapitation.

Craniotomy is discarded. Craniotomy with embryulcia might be done when conditions are not favorable (i.e., when the room is unsuitable for operation), but is not considered to be the best method. Cesarean section alone will not allow delivery in the vast majority of cases as the ring will rarely allow the extraction of the uncrushed head. The best choice for the patient lies between craniotomy followed by cesarean section, and craniotomy plus decapitation and cesarean section. As most cases have been handled and are apt to become septic, the author advises cesarean hysterectomy or the Porro operation. Under suitable conditions, immediate abdominal cesarean section with rapid incision of the ring internally would be the correct treatment.

R. D. MUSSEY.

PUERPERIUM AND ITS COMPLICATIONS

Spencer, H. R.: Nine Cases of Inversion of the Uterus. *Proc. Roy. Soc. Med.*, Lond., 1919, xiii, Sect. Obst. & Gynec., 20.

The author's report of his 9 cases of inversion of the uterus covers a period of twenty-five years of wide obstetrical experience. Puerperal inversion is by no means a common occurrence and it is often overlooked at the time of delivery. Hæmorrhage, shock, and malposition of the early puerperal uterus are the characteristic signs of this complication.

The atonicity and poor contraction give rise to the belief that the uterus may become inverted of

its own accord. The expert obstetrician would no doubt recognize this complication at once. A number of the author's case reports show that the confinement was attended by a medical assistant or midwife and it is quite possible that lack of experience on the part of these attendants was responsible for the complication or the failure to recognize it at its inception. None of the patients whose cases are reported was delivered in a hospital.

When puerperal inversion is not recognized within twenty-four or forty-eight hours after its occurrence, a cautious endeavor may be made to replace the inverted organ by hand. If the uterus is soft or septic, it should be irrigated with boric acid or salt solution and no attempt should be made to replace it until the latter part of the puerperium.

Aveling's repositor is the best instrument to replace the chronically inverted uterus, and it is unjustifiable to perform any cutting operation until the repositor has been tried.

It is the writer's belief that the original Aveling repositor will replace most chronically inverted uteri after labor. Should it fail, he would operate by the abdomen, incising the uterine cervix.

Great stress is laid on the importance of an accurate diagnosis of inversion due to fibroid polypus, myoma, and sarcoma. The non-malignant growths may be removed through the vagina. In cases of malignancy a vaginal or abdominal route hysterectomy may be done and followed by radium or X-ray treatment.

N. W. VAUX.

Gardiner, J. P.: Acute Dilatation of the Postpartum Uterus as a Cause of Postpartum Hæmorrhage: Its Analogy to Acute Dilatation of the Stomach, with a Suggestion on the Action of Involuntary Muscles. Preliminary Report. *J. Am. M. Ass.*, 1919, lxxiii, 1915.

The author states that acute dilatation of the uterus may occur either during the third stage of labor, or during the first hour after the expulsion of the placenta and membranes, but rarely later than this. It has been described as ballooning of the uterus with accompanying hæmorrhage.

Involuntary muscle has the power of rhythmic contraction not dependent entirely upon its closely associated network of nerve fibers. All hollow viscera have involuntary muscle walls and seem to possess a property which may cause them to go into acute dilatation after a period of undue stress and to contract again under direct stimulation. This occurs after the period of stress is over, as shown by the acute dilatation of the heart following severe exertion and of the stomach following the strain of an operation. Massage has caused an

acutely dilated heart to recover its tone. Contraction of the stomach occurs under stimulation but in acute dilatation it is impossible for this organ to relieve itself because the sphincters which control its outlets probably respond to the same stimulus. The same principle applies to the great vessels and the urinary bladder.

The author's conclusions are that all involuntary muscle possesses, beside rhythmic contraction and retraction, the ability to function normally for a time after a period of stress, then to assume a state of acute relaxation, and finally, within a limited time to return upon stimulation to its normal functioning.

The uterus being made up of involuntary muscle fibers is subject to the laws governing involuntary muscles. S. A. CHALFANT.

NEW-BORN

Berghausen, O.: The Control of Hæmorrhage in the New-Born. *Arch. Pediat.*, 1919, xxxvi, 643.

The author reports 6 cases of hæmorrhage in the new-born treated by transfusion of 2 per cent citrated blood obtained from the child's father or mother. In 5 of these cases the blood was injected into the superior longitudinal sinus, and in 1, directly into a vein.

When it is impossible to introduce the needle into the infant's vein the author injects from 100 to 150 c.c. into the superior longitudinal sinus with a 50 c.c. Luer syringe. The needle is inserted in the 'soft spot' just to the left of the median line and when the blood drops from it the Luer syringe filled with blood is attached and the injection is made slowly. Labored breathing and twitching of the face are interpreted as indicating an increase of intracranial pressure. When these signs are observed the injection must be made more slowly. Chills and a rise in temperature (100 to 102 degrees) are not infrequent but in the author's opinion are without significance.

In the cases reported the results were successful. The hæmorrhages followed circumcision in 2 cases and wounds of the skin and mouth in 2 others. In 3 cases they were gastro-intestinal.

H. K. GIBSON.

MISCELLANEOUS

Holmes, R. W.: Midwife Practice, an Anachronism. *Illinois M. J.*, 1920, xxxvii, 27.

Any movement which has for its purpose the creation of a new type of midwife is to be deprecated as it will merely perpetuate a survival of medieval times which is entirely out of harmony with modern prophylactic medicine.

The proper care of the parturient woman concerns the sociologist as well as the physician. The interpretation of what is proper care is as much an economic problem as a medical problem.

From its very nature, obstetrics has developed

into an actual surgical specialty. Only the properly trained physician with a knowledge of surgical technique and special training in obstetrical physiology and pathology is competent to circumvent the many ills of childbirth and to reduce its mortality and morbidity.

Legislation is often inconsistent and the enforcement of laws is often inversely proportionate to their importance to the common welfare. A man who expectorates on the sidewalk is far more apt to be arrested than the criminal abortionist.

The old saw that a little learning is a dangerous thing was never so true as in the case of the midwife. Badly taught, inadequately experienced, she never can grasp the broad facts that the delivery of a woman is a serious problem, that grave risks are present, that many of the obstetrical complications are so fulminating in their development and course that a lethal outcome occurs in hours, even minutes.

Midwives as a class are the worst transgressors of the medical practice act and the most flagrant violators of the criminal code.

While there are no midwife schools in this country other than so-called diploma mills, nothing would be gained by a scheme to create a midwife school under accredited authority. A concerted endeavor to weed out all unregistered or faultily registered midwives would be more effective. Instead of the conglomerate and indiscriminate list of midwives, osteopaths, 'practices of all sorts, and incidentally regularly licensed physicians, the county clerks should have separate entries for each class.

It is essential that a new survey be made of the condition of midwives soon in order that the situation as it exists today may be studied intelligently.

At best, midwifery is built upon shifting sands and any attempt to place the practice upon a firm foundation will merely interfere with plans for granting the parturient woman of the poorer classes scientific obstetrical care.

A co-ordinated educational movement to convince the public that in scientific obstetrical care lies the true conservation of the home will accomplish more good than any movement to uplift the practice of midwifery. EDWARD L. CORNELL.

Kuehnelt, P.: Some Placental Cavities and Their Relation to the So-Called White Placental Infarcts (De quelques cavités placentaires et leur relation avec le soi-disant infarctus blanc dans le placenta). *Acta chirurg. Scand.*, 1919, lii, 185.

In 1912 Meyer and Lohse described certain cavities in the placenta which vary in form and are always empty. These cavities are of clinical importance for, in case there is an open communication with the surface of the decidua, they may give rise to the erroneous impression that a part of the expelled placenta is lacking. They are of interest also because they may be related genetically to the so-called white infarcts of the placenta.

Beside these empty placental cavities Meyer and Lohse found also other cavities filled with a mucous

substance which, unlike the empty cavities, were never in communication with the decidual surface. The filled cavities were covered with a thick membrane composed of layers of different cells, while the empty cavities were covered by a homogeneous substance in which no cells were found. In a series of 200 placental sections examined by Meyer and Lohse empty cavities were found in 27, cavities filled with mucus in 28, and both types of cavities in 7. Therefore cavities were found in 24 per cent of the placental sections examined.

In pursuing similar investigations Kuehnelt discovered that the empty cavities have always an intracotyledonous situation while the filled cavities are extracotyledonous. He therefore classifies them according to their location. With this classification he gives the histologic details of the various forms.

In discussing the possible relationship between the placental cavities and placental infarcts Kuehnelt distinguishes between the red infarcts described by Williams and the white infarct, and states that in his opinion the former are hæmorrhages into preformed empty cavities. Favoring this view is the fact that microscopically all types of transitory forms containing a little blood can be found. Very recent microscopic examinations demonstrate that such hæmorrhagic apoplexies into empty cavities have three zones: (1) a central zone formed exclusively of red blood cells; (2) a fibrinous reticulum around

the central zone; and (3) an external zone of degenerated villi with strongly dilated vessels some of which have ruptured.

In 500 placental sections the author found 50 per cent of white infarcts. In some placenta multiple infarcts of all grades may be seen and these may become fused. In location they are distinctly intracotyledonous and near the decidual surface. In the formation of these infarcts there are two processes: (1) a central necrobiosis probably due to some disturbance of nutrition from the vessels of the villi; and (2) a peripheral capsular formation with the growth of the decidual tissue and the ordinary growth of the surrounding villi.

While the author must admit that white infarcts may form around the hæmorrhagic apoplexies in the empty cavities or at least that a tissue is formed which he is unable to differentiate from the white infarct, he does not believe that white placental infarcts are ordinarily formed in this way. His reason for this view is that while white infarcts are found in placenta of every age, he was unable to discover any irregular empty cavities in twenty very young placenta he examined nor any remnants of such cavities in white infarcts found in old placenta. He therefore concludes that there is no genetic relationship between the cavities described by Meyer and Lohse and the formation known as white placental infarct.

W. A. BRENNAN.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Braasch, W. F.: Surgical Renal Tuberculosis: The Prognosis. *Am. J. M. Sc.*, 1920, clix, 8.

This paper presents a statistical study of 532 patients operated upon for renal tuberculosis at the Mayo Clinic during a period of twenty years. As the total number of operations for the period amounted to 85,000, the incidence of renal tuberculosis is estimated at 0.6 per cent. The statistics bearing on postoperative results are based on the records of patients personally examined or heard from by correspondence. Detailed data were available in 346 cases and this series was studied to determine the influence of different complications. The results of the study are presented in twelve tables. The author's general conclusions are:

1. Renal tuberculosis occurs most frequently between the ages of 20 and 40 years (70 per cent).
2. It occurs in the male almost twice as often as in the female.
3. The postoperative mortality among male patients is somewhat higher than among the females.
4. In children the condition is usually not surgical but more often a part of a general tuberculosis.
5. Evidence of tuberculosis in other tissues of the body may be found in fully 71 per cent of the patients, if not in all.
6. The postoperative mortality among patients who have other associated lesions is not higher than that of the general average.
7. Multiple lesions do not necessarily render the prognosis more unfavorable unless they are a part of an acute general infection.
8. Evidence of healed pulmonary tuberculosis is present in fully one-third of the patients.
9. The percentage of recovery among patients with healed pulmonary tuberculosis is above the average and may be considered indicative of increased powers of resistance.
10. Coincident active pulmonary tuberculosis was found in approximately 5 per cent of the patients. More than 60 per cent of these recovered following nephrectomy.
11. Involvement of the genitalia was present in at least 73 per cent of the male patients and did not seem to affect the ultimate recovery.
12. The frequency of spontaneous healing of lesions in the prostate and seminal vesicles contra-indicated their removal by subsequent operation.
13. Evidence of tuberculosis involving the bones and joints was noted in 6 per cent of the cases; one-half of the lesions were active. The late mortality was 5 per cent. From this it may be inferred that the presence of such complications may be an index of increased resistance.

14. Spondylitis, usually healed, was present in 5.7 per cent of the cases and the mortality was 12 per cent.

15. Chronic spondylitis does not influence the prognosis. Active spondylitis, although it does not contra-indicate nephrectomy, will not offer a favorable prognosis.

16. Tuberculous adenitis was present in 19 patients (6.4 per cent), and the low mortality (10 per cent) was suggestive of a heightened resistance.

17. Reduction in hæmoglobin does not necessarily affect the prognosis.

18. The mortality among patients with marked bladder involvement was twice as great as that among those with slight involvement. The degree of involvement is dependent not so much on the duration of the symptoms as on the virulence of the infection.

19. The mortality percentage is markedly influenced by the degree of pathologic involvement of the kidney, increasing in proportion to the extent of the lesion. Early lesions have the lowest mortality and pyonephrosis the highest.

20. Occluded renal tuberculosis is indicative of relative immunity and a low mortality.

21. The duration of pre-operative symptoms does not materially affect the late mortality.

22. Recovery from bladder symptoms is more apt to occur, and to occur earlier, when the pre-operative symptoms are of short duration than when they have continued for a long time.

23. Recovery or permanent improvement of the remaining kidney will not follow the removal of one kidney in cases of bilateral renal tuberculosis.

24. Operation is advisable in cases of bilateral renal tuberculosis only when there are acute unilateral complications and no hope of eventual recovery.

25. Late mortality is highest during the first year and decreases with the length of time elapsing after operation.

26. The operative mortality is a negligible factor. The late mortality (five years or less after operation) is approximately 20 per cent. Failure to effect a complete cure occurs in approximately 20 per cent of the cases. In 80 per cent recovery is probable. A complete cure is to be expected in fully 60 per cent of the cases.

H. A. FOWLER.

Aschner, P. W.: Two Unusual Cases of Pyelonephritis. *J. Am. M. Ass.*, 1920, lxxiv, 320.

According to Aschner, no hard and fast rule can be laid down regarding the surgical indication in cases of pyelonephritis. Heretofore nephrotomy has been done for infections due to bacillus coli and bacillus pyocyaneus and nephrectomy for those due

to staphylococci and streptococci. Aschner claims, however, that in any infection the reaction of the body to the invading bacteria is of at least equal importance to the type of the micro-organism, and that the decision in regard to the operation should be based first of all on the patient's clinical condition.

Primary nephrectomy is by far the safer procedure when there is evidence of severe septic absorption or renal insufficiency with nitrogen retention, or when the illness has been of long standing and the patient has suffered great loss of weight and strength. In such cases the margin of safety is small. Nephrectomy is indicated as decapsulation and nephrotomy do not remove the focus, do not protect against extension and metastasis, and expose the patient to secondary hæmorrhage, recurrence of infection, and the dangers of secondary nephrectomy.

The main points of interest in the first case of pyelonephritis reported in this article were as follows:

1. The sudden appearance of a virulent infection precipitated by an indwelling catheter.
2. Numerous concretions in a prostatic adenoma.
3. Infection of a kidney which showed a congenital anomaly (bifid ureter and double pelvis).
4. Uræmia which was produced by unilateral pyelonephritis and disappeared immediately when the offending organ was removed.
5. An excellent functional result following nephrectomy.

In the second case the bacillus coli was found in the bladder urine but not in the ureteral urine. The culture of the urine from the right ureter just before operation showed "anæmolytic streptococci," but as this fact was not known at the time of operation, a nephrotomy was done. A phosphatic stone was removed and the wound closed. As the patient did not improve, a nephrectomy was done the seventh day. Death followed three days later from peritonitis apparently of metastatic origin. In Aschner's opinion, this patient might have been saved by a primary nephrectomy. H. A. MOORE.

Lamson, O. F.: Recurrent Nephrolithiasis. *Ann. Surg.*, 1920, lxxi, 16.

The author states that the general etiology of recurrent nephrolithiasis cannot differ materially from that of primary stones and therefore the various causes to which renal calculi have been ascribed should be borne in mind.

Some of these etiological factors may be remedied at the time of the operation by careful or special technique.

Factors which tend to prevent the recurrence of stone are: (1) as accurate a pre-operative diagnosis regarding the localization and size of the stone as it is possible to obtain with the X-ray and cystoscopic examination; (2) an operation so planned that no injury to the pelvis of the kidney or the ureters causing stricture will result; and (3) an incision either in the pelvis or through the kidney substance suffi-

ciently large to permit the surgeon to lift out the whole stone easily without leaving behind small scales or particles broken from it.

The article is summarized as follows:

1. We cannot hope to prevent the recurrence of nephrolithiasis unless we know more regarding its true etiology.
2. Careful study of the patient's history in all its different aspects, a thorough examination of the urine, and chemical analysis of the stone will determine the postoperative treatment.
3. Thorough flushing of the urinary channels by the extensive drinking of water, preferably distilled water, may help in the dislodgement and removal of any possible nucleus for future stones. This treatment must be continued for a considerable period even after the urine has completely cleared up.
4. Faulty or incomplete surgery which leaves fragments of stones in the pelvis may contribute toward a recurrence of nephrolithiasis.

V. D. LESPINASSE.

BLADDER, URETHRA, AND PENIS

Caulk, J. R.: Hour-Glass Bladder; Remarks on the Resection of the Base of the Bladder for Transverse Septa. *Ann. Surg.*, 1920, lxxi, 22.

The author describes two cases of hour-glass bladder, one that of a male and the other that of a female. In the first case there was absolute retention of the urine and before that the patient was able to urinate much more easily when lying down than when standing up.

Cystoscopic examination disclosed an elevated band about $\frac{3}{4}$ in. behind the interureteral bar, which ran transversely across the base of the bladder, fanned out on each lateral wall, and had a concavity anteriorly, giving the bladder a double pouch, the bas-fond in front and another pouch behind. The mucous membrane over the bar was pale.

During the operation, which consisted of resection of the band and a portion of the redundant mucosa, it was noticed that the mucosa behind the bar was very loose and could be pulled down so as to occlude the urethral orifice. This accounted for the urinary retention.

In the second case the band was about 1 in. back of the trigone and showed an elevated partition that completely crossed the base of the bladder and fanned out on either side, causing a slight puckering of the bladder laterally with a depression in front of it and behind it. The same operation was performed as in the first case and the results were highly satisfactory.

The author states that he is convinced that incising these bands would not have effected a cure as they involved the whole bladder wall. The operation he performed is not difficult and can be done from the outside but care is required in approaching the external vesical coat. Hæmorrhage is easily controlled. The first case reported is of interest on

account of the large amount of redundant bladder wall resected and illustrates a prolapsus of the type described by Villier, Streubel, Vary, and others.

V. D. LESPINASSE.

Legueu, F., and Papin, E.: Cystoradiography (La cystoradiographie). *Presse méd.*, Par., 1919, xxvii, 733.

In the authors' opinion cystoradiography is absolutely essential for the study of vesical diverticula. Their method is to take a picture of the bladder after filling it with an opaque solution and again after it has been emptied. If a diverticulum is present it will not be evacuated with the bladder and will therefore show in the second picture. In this manner diverticula have been discovered in cases in which they were not even suspected.

The radiography of bladder tumors is very interesting. Small tumors, which are easily discovered by cystoscopy, however, do not require it. Voluminous and medium sized tumors, especially those which cannot be explored with the cystoscope because of constantly associated hæmorrhage or intense cystitis, should be examined by the X-ray. Also those which can be seen only in part with the cystoscope.

Radiography of vesical calculi following the inflation of the bladder with air or oxygen has given very satisfactory results. The results obtained when the bladder is filled with bismuth solution or collargol, on the other hand, have been very unsatisfactory.

In summing up the authors state that cystoradiography is indispensable in the diagnosis of vesical diverticula, useful in the diagnosis of large tumors and vesical malformations, of little value in cases of prostatic hypertrophy, and an aid in the localization of vesical calculi.

W. A. BRENNAN.

Lindeman, H. E.: Chronic Trigonitis in the Female. A New Method of Treatment; Preliminary Report. *Surg., Gynec. & Obst.*, 1920, xxx, 64.

Chronic trigonitis is one of the chief factors in irritable bladder in women. The cause of the condition is not known. It may be a chronic cystitis, though there is no definite evidence supporting this theory. The symptoms begin gradually, usually with an increasing frequency of urination by day and night, and a constant desire to urinate. With this there is the sensation of incomplete emptying of the bladder so that after urination there is a desire to urinate again. The condition lasts for many years and becomes progressively worse.

The bladder capacity is generally large and through the cystoscope the bladder walls outside the trigone appear normal. When the trigone is brought into view, however, it is found to be swollen, dark red, angry looking, and cloudy. Numerous fine blood vessels are seen. Not infrequently there are red spots scattered over the trigone and sometimes small cysts. The mucosa is distinctly thickened and velvety.

The ordinary treatment by topical application of solutions of silver nitrate varying in strength from 1 to 5 per cent gives slight relief in some cases, but is far from satisfactory. The author has therefore developed a needle and cannula for use with the ordinary Brown-Buerger catheterizing cystoscope by means of which he injects a solution of quinine and urea into and under the mucous membrane of the trigone. He uses solutions varying in strength from 2 to 3 per cent which are colored with methylene blue. The quinine causes a deposit of fibrin about the vessels which strangulates them and causes the trigone to return to a nearly normal appearance. Following this there is almost immediate relief of symptoms for a considerable period of time. The author finds that from two to four treatments at intervals of from one to two months will bring almost complete relief in even the most aggravated cases.

Nicolich: Endoscopic Electrocoagulation of Vesical Papillomata (Elettrocoagulazione endoscopica dei papillomi vesicali). *Clin. chir.*, 1919, xxvi, 609.

The author gives the clinical histories of 13 cases of papilloma of the bladder treated by the electrocoagulation method of Beer of New York. This method has been used by many surgeons abroad with good results and has the advantage that it renders cystotomy unnecessary. According to some writers cystotomy favors recurrence as the mucous membrane of the bladder may become inoculated by small particles of the papilloma where it is injured surgically. Another advantage of the endoscopic method is that its use does not require the patient to remain in the hospital.

The author obtained excellent results in his 13 cases. Following such treatment the patient should be subjected to cystoscopic examination at intervals to determine whether an actual cure has been effected. If there is a recurrence one additional treatment is usually all that is necessary.

W. A. BRENNAN.

Stern, M.: The Palliative Treatment of Urethral Stricture. *N. York M. J.*, 1920, cxi, 4.

The end-results of the palliative treatment of urethral stricture are better than those obtained by external urethrotomy. Palliative measures are of the greatest importance at the time the patient seeks a remedy for the increasing difficulty of micturition and the progressive diminution in the size of the urinary stream.

Inflammation of the strictured area and œdema are the causes of the symptoms in all cases and it is these conditions rather than the stricture itself which should receive attention. The spongy œdematous tissue is extremely soft, bleeds easily, and obstructs the passage of filiform and other pliable dilating instruments. It is responsible also for the arrest of the urinary stream. After the subsidence of the symptoms referable to the inflammation, efforts should be directed toward softening the

infiltrate and facilitating its absorption. These measures must not be instituted too early as, even later, overactive measures often result in a setback.

In certain cases of stricture requiring operation temporizing is not only useless but even dangerous. Patients requiring surgical treatment may be divided into five classes as follows:

1. Patients who come for examination in an anxious and desperate frame of mind after days and nights of exhausting efforts to void. In these cases the author fears ether narcosis and is opposed to suprapubic puncture, but obtains gratifying results from suprapubic drainage under gas oxygen narcosis. After the patient has rested for about ten days, during which time drainage is maintained, it is possible to penetrate the strictured area with an instillation tube. Later sounds may be passed.

2. Those with extravasation of urine and other acute lesions. These patients must be operated upon promptly and rapidly.

3. Patients with traumatic stricture resulting from external violence or following an external urethrotomy.

4. Patients suffering from recent traumatism following instrumentation and who have false passages and much bleeding. These must be given immediate relief.

5. Irresponsible patients who, because of ignorance or carelessness, have absented themselves from treatment until forced to return because of frequent recurrences of retention.

In discussing the choice of operation the author states that frequently a rapid cystotomy under gas oxygen narcosis will be all that is necessary, especially if retrograde dilatation or internal urethrotomy is done in addition. As a rule strictures anywhere anterior to the bulb do not lend themselves to dilatation. They contract very rapidly and internal urethrotomy is indicated. Before treatment is instituted in the non-operative cases it is necessary to differentiate between a simple anæmic infiltrate and an infiltrate with inflammation. Palliative treatment gives much better results than external urethrotomy, especially in cases of stricture at the bulb.

Patients with inflammatory stricture and occlusion of the urethra should be sent to the hospital immediately. The bladder should be emptied at once or allowed to empty slowly. A hypodermic injection of morphine sulphate should then be given before any urethral manipulation is attempted, and an injection of 2 drams of 1 per cent novocaine solution containing 3 drops of adrenalin should be allowed to remain in the urethra for ten minutes. As a rule the patient will then void voluntarily, but should he be unable to do so, a No. 16 blunt-end metal or soft rubber catheter should be passed. If this fails, the insertion of a ureteral catheter with a No. 3 probe-end may be attempted. If this catheter does not enter, Stern uses a urethroscope of the Guerringer type which he devised himself and has

used with great success. In several cases he found that the difficulty was due to slender bands and that after these bands had been destroyed with a fulgurating electrode it was possible to pass small sounds easily.

In inflammatory stricture with partial retention the author has obtained excellent results with a hypodermic injection of morphine sulphate, a hot hip bath, and continued rest, the stricture being treated through an instillation syringe with argyrol solution alternated with warm boric-acid irrigations.

Stern regards cases in which bleeding does not follow the introduction of instruments and the urine is clear as cases of anæmic stricture. Such cases may be treated by dilatation. In anæmic stricture also an effort should be made to soften the infiltration and cause its absorption by means of heat hyperæmia and dilatation with the aid of hot water. Soft bougies should be introduced every second or third day and irrigations given at intervals for fifteen minutes.

While the author does not claim that palliative treatment effects a permanent cure, he asserts that by such means the condition is so greatly improved that no further treatment is required for at least a year and in some cases it appears that an actual cure has been obtained. The patients are instructed to report for further treatment whenever the slightest diminution in the urinary stream is noted.

LOUIS GROSS.

Stern, M.: A Plastic Operation for the Cure of Urethral Stricture. *J. Am. M. Ass.*, 1920, lxxiv, 85.

The author states that in view of the fact that external urethrotomy does not give lasting benefit and is never performed with the hope of affecting a cure, it should be replaced by an operation that will secure such results. The operations of Russell, Marion, and Cabot have advantages over external urethrotomy but are more or less difficult to perform because they injure the corpus spongiosum, causing hæmorrhage which obscures the field.

Stern advocates a method which effects the excision of the strictured floor at the bulbomembranous juncture without inflicting injury to the overlying structures or to any other portion of the urethra. His operation consists in separating the muscle structures, exposing the corpus spongiosum and detaching it from the triangular ligament, elevating the urethra, and exposing the strictured area. The strictured area is excised and the repair made in a horizontal direction to avoid any diminution in the lumen of the urethra. The overlying structures are then restored to their normal position. An indwelling catheter is placed in the urethra for several days and the layers of tissue are securely sutured over the urethral wound. Primary union occurs and there will be no escape of urine through the wound. The pre-operative preparation of the patient consists of the introduction of a ureteral catheter through the stricture with the aid

of the author's instrument. As a result of the drainage of urine thus afforded the cystitis, urethral oedema and the patient's general condition will be improved.

The postoperative treatment consists of the insertion of the indwelling catheter which is left in place for forty-eight hours and then slowly withdrawn while a gentle stream of hot boric acid solution flows through it. A sterile catheter is then inserted and left in place for twenty-four hours. On the fourth day the patient is catheterized every four hours or when request is made. On the fifth day voluntary micturition is allowed. On the tenth day a sound is passed and a week later a larger sound is inserted.

The author's conclusions in regard to his operation are as follows:

1. Since all, or nearly all, strictures are anterior to the superficial layer of the triangular ligament, the operation described can easily reach them. Extravasation of urine or infiltrating abscesses need not be feared as the membranous or prostatic urethra lying posterior to the triangular ligament is not disturbed.

2. An operation which involves only the diseased area and which does not inflict injury to any other part of the urethra is a logical step toward a cure and is superior to procedures in use heretofore.

LOUIS GROSS.

GENITAL ORGANS

Meltzer, M.: Factors of Safety in Prostatic Surgery: Indications for the Operation. *N. York M. J.*, 1919, CX, 942.

Before it can be determined whether a prostate may be enucleated, a systematic routine series of examinations is necessary. Many patients present themselves when they are already manifesting symptoms indicating uræmia and in such cases drainage of the bladder, forced fluids, urinary antiseptics, and careful nursing will save their lives and soon improve their general condition and renal function.

The usual examination alone, however, will not indicate when a favorable condition has been reached. It can be ascertained only by routine examinations and a careful determination of the following data: (1) the appearance of the tongue; (2) the blood chemistry, with special reference to the retention of creatinine, urea nitrogen, and non-protein nitrogen; (3) the kidney function; and (4) the general condition. The results of these examinations will indicate whether or not a prostatectomy can be done.

In cases of prostatitis the tongue is an index of the inability of the kidneys to excrete the toxins resulting from urinary obstruction. It is dry or almost dry, feels rough to the touch, and is fissured with definite cracks. In color it is usually a dirty brown or a very bright red with a sort of enamel luster.

The study of the chemistry of the blood is a very valuable method of determining the patient's ability

to withstand surgical intervention. If the blood examination shows high figures nothing more than urinary drainage and expectant treatment can be given.

To determine the kidney function the author uses the intramuscular injection of phenolsulphonephthalein.

In the general condition a failing myocardium, a decompensated valvular lesion, marked oedema, generalized anasarca, a cirrhotic liver, and an excessively high or low blood pressure are contra-indications to radical surgical treatment.

C. R. O. CROWLEY.

Deaver, J. B.: Some Practical Points on Prostatic Surgery. *Am. J. M. Sc.*, 1920, CLIX, 1.

Three important factors which would decrease the mortality rate following prostatectomy are: (1) the recognition of absolute contra-indications to operation; (2) the recognition of relative contra-indications to operation; and (3) pre-operative treatment to remove the relative contra-indications to operation and bring the patient within the operable class.

Subnormal function of the kidneys furnishes an illustration of these factors. For example, impending uræmia due to chronic interstitial nephritis, itself irremovable, is an absolute contra-indication to operation. In the presence of a mild chronic interstitial nephritis subnormal renal function may be due to the back-pressure of obstruction. Here the contra-indication is only relative since renal decompression may so improve the renal function that prostatectomy may be done successfully. Cardiovascular decompensation is another relative contra-indication to operation but in only a small proportion of such cases is operation precluded. The majority of complicating factors are removable and after their removal an operation can be performed safely. The surgeon's success is dependent far more upon his ability to recognize and treat relative contra-indications and to select the proper time for operation than upon his technical skill in removing the obstruction.

The general mortality throughout the country is above 20 per cent following operation, and 60 per cent of the deaths are due to uræmia, hæmorrhage, shock, and sepsis. The mortality rate attributable to uræmia and sepsis is practically the same as that due to hæmorrhage and shock. In other words, half the operative mortality depends upon complications existing as contra-indications to operation, and half upon the technical complications of the operation. A reduction in the mortality, therefore, must depend upon the preliminary treatment of the relative contra-indications and the prevention of hæmorrhage and shock by appropriate operative technique.

The author discusses in detail some of the contra-indications to operation. Of these, renal failure is the most common. Various methods of determining renal function are mentioned. The author prefers

the blood-urea test for retention and the phthalein test for excretion, but states that the surgeon must be familiar with the various other tests sometimes indicated. The simple tests of the quantity of the urine and the specific gravity must be borne in mind as they give important data.

Preliminary treatment before prostatic surgery is practically always necessary. In cases of retention the indwelling catheter is preferred when its use is possible. Otherwise, a preliminary suprapubic cystotomy should be done. Preliminary cystotomy has reduced the mortality of prostatectomy more than any other single procedure. In early cases, when the patient is in good condition, the two-stage operation is not employed. The success of prostatectomy is dependent chiefly upon preliminary treatment. The technical details in the enucleation of the prostate are of secondary importance.

H. A. FOWLER.

Cunningham, J. H.: Essentials of Success in Prostatic Surgery. *N. York M. J.*, 1920, cxi, 138.

The pre-operative study and preparation of patients for prostatic surgery includes cystoscopy by which information may be obtained regarding the presence or absence of malignancy, free drainage of the bladder either through the urethra or otherwise, various functional tests, and the observation of the patient during a period of time sufficiently long to justify judgment as to his operability.

The operative cases must be divided into those which require conservative methods and those for which radical surgery is more suitable. In the

former the Bottini or Chetwood operation or the establishment of a permanent suprapubic sinus may be done. For the bar type of case with contraction of the vesical neck the punch operation is indicated.

Radical operations are best performed under gas-oxygen anæsthesia and should be chosen according to the individual case. The suprapubic route Cunningham uses only for patients who are in good general condition as the mortality of this operation is high. For patients in poorer general condition and when the gland is of the smaller fibrous type, he uses the perineal route. In these cases either the perineal dissecting operation or the median perineal enucleation operation may be done. As the latter is the more rapid it is best for patients in poor general condition. Malignant glands should be radically removed only in rare instances as in this type of case the mortality is high and the functional results are poor.

Great emphasis is placed on the importance of the postoperative care. This includes the personal attention of the surgeon and of carefully trained assistants. To guard against hæmorrhage following operation by the suprapubic route Cunningham uses the Pilcher bag. Perineal hæmorrhage may be controlled by packing. In cases in which the punch operation has been done a De Pezzer catheter drawn snugly down to the vesical sphincter will suffice.

If wound infection occurs at all it will occur in the cases operated upon by the suprapubic route. This should be guarded against by avoidance of trauma to the wound at the time of operation, complete hæmostasis, and proper wound closure. Infection demands free drainage. H. L. SANFORD.

SURGERY OF THE EYE AND EAR

EYE

Maxted, G.: Perforating Wounds of the Eye: An Investigation of 106 Cases Occurring in Soldiers at a Military Center in London. *Brit. J. Ophth.*, 1920, iv, 12.

This paper reports the results of 106 eye wounds not necessitating immediate enucleation. The nature of the accident, the seat of perforation, the injury to the lens, the prolapse of the iris, sympathetic ophthalmia, and vision are all considered.

There was only one case of sympathetic ophthalmia in the series although there were 37 wounds in the danger zone and 46 cases of foreign bodies in the eye. In 24 of the 46 cases the body had been extracted early with a magnet before the patient was seen by the author. The eye was enucleated in 9 of the remaining 22 cases. One patient died following another operation; 9 left the hospital with the foreign body still in the eye but had light perception. The remaining 3 had vision of 3/60, 6/36, and 6/9 at the time of the report.

T. D. ALLEN.

Key, B. W.: Antidiphtheritic Serum in Severe Ocular Infections, with Special Reference to Hypopyon Keratitis. *Arch. Ophth.*, 1919, xlviii, 581.

Key reviews extensively the literature and the theoretical status of para-specific serum therapy, giving the views not only of those who are enthusiastic but also of those who are skeptical regarding its efficacy. He analyzes 23 cases of hypopyon keratitis, 2 cases of infection of the anterior chamber following penetrating wounds, 4 cases of panophthalmitis, and 1 case of ulcer serpens. Particular emphasis is laid upon the effect of the serum upon the general systemic condition when it is combined with other indicated therapy. In the cases of keratitis hot applications, bichloride vaseline (1:5,000), atropine, and when necessary, hot salt-solution irrigations according to Verhoeff's technique were used in addition to the serum. As a result of this treatment the ulcer debris disappeared rapidly, the transparency of still unhealed corneal tissue was greatly increased, the opacities were surprisingly mild, and the vision was better than expected.

In the cases of penetrating wounds of the cornea with infection of the anterior chamber the globe was preserved and there was useful vision.

In the cases of panophthalmitis cure was not remotely anticipated and at no time was there any evidence of it, but in every case the symptoms, both objective and subjective, subsided and the infection rapidly became of a quiet, mildly virulent type.

The case of ulcer serpens is not discussed in very great detail.

In concluding his article Key reviews the changes both general and local which follow the administration of the serum, emphasizing especially the rapid relief of symptoms, the checking of the infectious process, the disappearance of hypopyon with its reappearance on lapse of treatment and prompt disappearance following another injection, and the apparent increase in the resistance and defense of the tissues as demonstrated in the 4 cases of panophthalmitis. Following the injection of the serum, many cases in which long-continued local treatment had produced little or no effect showed definite improvement and cure.

Darier is quoted as stating that the strong toxins such as diphtheria toxin stimulate all the organs of the body to form antitoxins and thus the use of serum is effective in all kinds of infections. Key reminds us that receptors of the first order (antitoxins, agglutinins, and precipitins) pass in small quantities into the aqueous humor and that the normal cornea shares in the general bacterial immunity. He explains the local effect as due to a vasomotor action whereby new and highly efficient leucocytes are supplied to the part in increasing numbers per unit of time. He recommends a dosage of 2,000 units followed every second day by an equal dose or daily by a dose of 1,000 units for three or four days.

T. A. ALLEN.

McAll, P. L.: Notes on a Rare Form of Subconjunctival Granuloma Met With in Central China. *Brit. J. Ophth.*, 1920, iv, 20.

The author describes a rare tumor growth in the conjunctiva or subconjunctival tissue of which he has seen about a dozen cases. This tumor is without inflammation or ulceration. It is a painless, red, firm, fleshy protrusion of the conjunctiva of the fornix which as a rule begins in the upper inner canthus and spreads slowly until it involves both fornices and both canthi, thus causing the palpebral fissure to become concentrically reduced. In an extreme case, it is represented by a tunnel about $\frac{1}{8}$ in. across, leading down to the clear cornea. This tunnel becomes blocked with secretions or eczematous scales with resulting loss of vision.

The skin is not infiltrated, but the conjunctiva is closely adherent. The growth is not encapsulated, and in operating it is difficult to determine whether all the diseased tissue has been removed. After operation the lids cicatrize, become indurated and adhere to the globe, and the growth recurs.

The bulk of the growth is composed of round cells (lymphocytes) infiltrating normal tissue. No organisms or parasites have been discovered.

Benedict, W. L., and Barlow, R. A.: Treatment of Chronic Dacryocystitis. *Am. J. Ophthalm.*, 1919, ii, 843.

The authors discuss the advantages and the technique of the intranasal operation for chronic dacryocystitis. "Inflammation of the lacrimal sac may be said to have become chronic when the function of the drainage apparatus cannot be restored by the use of medical or hygienic measures, and operative procedures have to be employed either to restore the function of the duct or to remove the sac and obliterate the duct. The treatment of chronic dacryocystitis is ultimately surgical. To dispose of the troublesome and dangerous secretion is the high aim of treatment. If at the same time the function of the duct can be restored, a double aim will have been accomplished. Removal of obstruction to the intranasal portion of the duct and careful use of small probes will be sufficient in many instances to reestablish potency of the duct. Destruction of the sac by actual or potential cautery accomplishes only one thing; it stops the secretion from the tissues destroyed. Extirpation of the sac after the method of Meller gives most satisfactory results in most cases. When the sac has not been destroyed it may be tapped from the nasal side, by a procedure that will at the same time allow exposure of the anterior ethmoid cells and take care of any other intranasal obstruction."

The technique is described in detail and fully illustrated.

T. A. ALLEN.

González, J.: Another Case of Malignant Pterygium (Un caso más de pterigión maligno). *Med. Ibera*, 1919, iii, 80.

In 1918 González published the results obtained by the subconjunctival injection of fibrolysin in cases of malignant pterygium in which the classical surgical treatment had failed several times. In this article he reports another case of the same sort.

The patient presented himself at the dispensary with an enormous pterygium on the left eye. He had been operated upon four times at other clinics and each time the condition had recurred. He expected to undergo another operation, but in view of the tendency of the excrescence to recur, it was decided to try the fibrolysin treatment.

From the internal angle of the left eye, near the caruncle, a thickening of the bulbar conjunctiva of fibrous aspect, hard and very prominent, extended along the base of the conjunctival sac, its most external part reaching to the cornea. The surface was not uniform; in the center were small elevations a number of which surrounded a larger elevation which was red, conical, and smooth. From the base of the latter a membrane paler than the rest of the excrescence extended downward and inserted into the free border of the lower eyelid. The pterygium covered a large part of the cornea, reaching almost to the midline and hiding half of the pupil. In the rest of the eye there was a generalized conjunctivitis with an abundant secretion of mucus.

The first three days of treatment were devoted to the correction of the congestion since as a rule fibrolysin acts better in tissues which are not hyperæmia. On the sixth day, after anæsthesia was induced with cocaine and adrenalin, a few drops of a 1:50 solution of fibrolysin were injected. This was followed by a slight vascular reaction lasting about fourteen hours. After that a slight pallor was noticed throughout the pterygium, especially in the portion covering the cornea.

Four days later the second injection of the same solution of fibrolysin was made. The pallor of the membrane then became accentuated and extended to the fleshy elevation. The fibrous portion near the caruncle and the semilunar fold, however, showed no appreciable change.

The same solution was then injected a third time. The ischæmia in the zone it infiltrated was very marked and the small elevations have become almost imperceptible.

For the fourth injection a 3:100 solution of the fibrolysin was used. Slight pain and a light reaction which followed passed off in a few hours. The membrane over the cornea was by this time much thinner and beginning to become transparent.

After the fifth injection the tenseness in the bands of symblepharon which decreased the palpebral aperture disappeared, permitting greater mobility in the lower lid.

After the sixth injection the large fleshy elevation was so flat that it seemed about to disappear and the rest of the pterygium was much atrophied and very pale.

At the end of fifteen days the patient was discharged. The article contains illustrations showing the eye as it was at first, the improvement after the fifth injection, and the results at the end of treatment.

M. M. MATTHIES.

EAR

McKenzie, D.: Congenital Redundant External Meatus; Repeated Abscess Formation; Excision. *Proc. Roy. Soc. Med.*, Lond., 1919, xiii, Sect. Otol., 5.

The patient, a boy aged 7, presented at birth a redundant auricle on the right side. After repeated operations for abscess behind and below the left ear the condition was found to be due to a second redundant external meatus. The position, pathology, and probable pathogenesis of the latter was as follows:

The accessory meatus was anterior to the mastoid process and below the normal meatus. The bony floor of the latter seemed deficient and a fine skin-lined fistula connected it with the accessory structure. The skin-lined tube was an inch long and ended blindly. It was surrounded by a thick fibrous collar throughout, especially at its outer end where the adjacent tissues were pus-soaked. A second fistula, that of the original abscess, discharged behind and below the auricle. A cartilaginous

nodule, probably the auricular cartilage of the redundant meatus, was distinct from the latter and lay close to the posterior surface of the normal auricular cartilage.

Pathologic examination disclosed a tube simulating a meatus with suppurating sinuses connected to it. The tube was composed largely of dense fibrous tissue. It was bound by muscle fibers and contained sebaceous glands and hairs and islands of cartilage, but no cartilaginous plate. The lumen and the channels of the fibrous tissue contained inflammatory products. The structure throughout was most erratic as is usual in an accessory organ.

The steps in abscess formation are: first, secretion into the lumen of the meatus; then, pus formation following infection through the fistula into the normal meatus; and finally, external discharge through the postauricular fistula and in part through the softened adjacent tissue.

Close analysis of the literature reveals but four cases comparable in detail to the congenital malformation described, but four others, in which the congenital origin is doubtful, resemble it.

J. D. COOK.

Royster, L. T.: Otitis Media. *South. M. J.*, 1920, xiii, 10.

Royster discusses otitis media from the standpoint of the pediatrician. After emphasizing the importance of the complications of measles, scarlet fever, rhinitis, nasopharyngitis, whooping cough, and influenza, and urging prompt examination of the ears when there is an unexplainable rise of temperature, he mentions eight distinct types of infection which he has observed following influenza:

Type 1. By far the most common type is that in which there is fever, general redness of the drum, with or without bulging, and sometimes pain. On being incised promptly the drum discharges a purulent or mucopurulent bloody fluid. This discharge may continue for from twenty-four hours to several days. The drum then heals promptly and returns to its natural bluish-gray color.

Type 2. A second type is one in which the drum does not heal so promptly after being incised and the condition runs a prolonged course. In some cases the drainage continues until the mastoid cells are thoroughly cleaned out.

Type 3 is a type in which the middle ear infection is followed very rapidly by acute mastoiditis.

In Type 4 there is a red bulging drum which on incision emits a single perle of thick, tenacious, glairy mucus resembling grape pulp. This is expelled with evident force and on the following day the drum is perfectly normal in appearance.

Type 5 is a type in which the drum is red and thick like red parchment but not bulging. When incised, it bleeds freely, scantily, or not at all, but does not discharge pus or serum. Some cases clear up quickly, while others tend toward a chronic course, but clear up completely after the removal of adenoids.

Type 6. This is a type in which the drum is red and when it is incised air or gas under pressure escapes with a distinct hissing sound.

Type 7 is characterized by the formation of a bleb on the membrane—true myringitis.

In Type 8 the drum is thickened but not red, and there is fever. Incision of the drum evacuates pus.

The author believes that the drum should be incised before bulging has occurred. O. M. ROTT.

Blackwell, H. B.: The Treatment of the Chronic Discharging Ear. *N. York M. J.*, 1919, cx, 933.

The successful treatment of chronic otorrhea depends upon removing the pus thoroughly and regularly and keeping the canal not only clean but dry. The physician should instruct the patient how to do this. The chief requisite for successful results is aeration of the middle ear. The tympanic cavity must have a free opening to the air, both externally by way of the auditory canal, and internally by way of the eustachian tube. The removal of granulation tissue in the form of nasal polyps should invariably precede curative measures of any kind. To obtain internal aeration by way of the eustachian tube all causes of nasal obstruction, such as deflected septa or nasal polyps, should be curetted or removed.

For the treatment of a profuse discharge from the ear boric acid irrigations are recommended. These should be repeated as often as necessary to remove the pus and lessened as the discharge diminishes.

J. J. KING.

Lewis, J. D.: Acute Mastoiditis. *Minnesota Med.*, 1920, iii, 15.

In order to establish prompt and adequate tympanic drainage, the older practice of merely puncturing the drumhead (paracentesis) should be replaced by free incision (myringotomy). This measure often serves not only to terminate the purulent condition of the middle ear but to prevent a further extension of the process beyond the tympanic cavity.

After the performance of myringotomy or the occurrence of spontaneous rupture of the drumhead invasion of the mastoid cells is indicated when the streptococcus capsulatus is found to be the predominant organism in the aural discharge. This virulent organism induces extremely rapid extension and destruction. In 3 cases of mastoiditis of pneumococcal origin recently operated upon by the author the mastoid involvement followed in from five to eight days after the acute aural infection.

Marked impairment of the hearing and a sudden cessation of the aural discharge, indicating an interference with drainage, afford conclusive evidence of mastoiditis and indicate operative intervention. Other reliable manifestations are the unsymmetrical meat in the otoscopic picture and a persistent discharge from the middle ear continuing for ten days or longer.

The performance of mastoidectomy before the onset of complications is attended with little risk even when the sigmoid sinus and dura are uncovered for inspection provided the dura is not wounded at operation.

The author concludes his article with the statement that while conservatism in itself is commendable, it is not expressed by deferring myringotomy or mastoidectomy when they are indicated.

J. J. KING.

MacNaughton, P. D., and Swift, G. W.: Some Observations Recorded in a Series of 159 Mastoid Operations at Fort Riley, Kansas, from September, 1917, to August, 1, 1918. *Mil. Surgeon*, 1920, xlv, 94.

The report includes 159 primary operations and 26 secondary operations, making a total of 185. Simple mastoidectomy was the usual procedure. In a fair proportion of cases it was necessary to remove the posterior superior wall of the external canal down to the annulus because of the extensive necrosis. Primary radical mastoidectomy was performed in 15 cases. Ligation of the jugular vein and closure of the lateral sinus were done in 4 cases. The dura was extensively exposed in 4 cases in which the radiographs showed necrosis of the dural plate. One extradural abscess and one temporal lobe abscess were drained. Both of these patients recovered.

The tonsil was found to play an important part in the infections of the streptococcal type. The blood cultures, which showed the presence of streptococcus hæmolyticus, and the postmortem findings indicated that mastoiditis is not always due to direct extension from the nasal and pharyngeal membranes by way of the eustachian tube; that the tonsil is the usual seat of infection of the blood stream; that otitic meningitis is a rare complication; and that general meningitis may occur with mastoid infection and may be independent of the mastoid infection.

On the basis of the observations reported, the authors arrive at the following conclusions:

1. The tonsil plays an important rôle in the etiology of mastoiditis of the acute type.

2. A primary focus developing in the mastoid area is of acute onset; rapid destruction of bone is the result.

3. Other infections, such as pneumonia, meningitis, and toxic joints, frequently occur at the same time.

4. The most reliable diagnostic symptom during the entire course of mastoiditis is the persistent headache.

5. The value of radiograms before and after operation depends upon the technique and their interpretation. They should form a part of the preparation for operation and after-treatment.

6. Meningitis due to extension from the mastoid was very rare in this series. Only one case was of otitic origin.

7. Meningitis due to blood-stream infection of the streptococcus type frequently occurs when the mastoiditis also is due to blood-stream infection.

8. Exposure and breaking through of the lateral sinus and dura during operation are not serious accidents but should be avoided when possible.

9. Ligation of the jugular vein should be anticipated at all mastoid operations.

10. Carrel-Dakin solution and dichlorazene paste are of great benefit in the after-treatment. The former helps to cleanse the wound of secretion and may be used safely every second or third day. The paste should be fresh and its application should be begun at the third dressing.

11. Serum treatment is of no avail when the radiograms show involvement of the cells but is of great benefit when a septic temperature follows operation. All patients with blood-stream streptococcus infection should be given anti-streptococcus serum intravenously for several days after operation. It is best given in 25 c.c. doses every three or four days. There is little reaction and the resultant fall in temperature is remarkable. J. J. KING.

Dickson, T. A.: The Mastoid Operation under Local Anæsthesia. *Texas State J. M.*, 1919, xv, 290.

For mastoid operations the author uses novocaine along the auricularis magus and occipitalis minor, over and around the tip, down the side of the canal, and above the zygomatic ridge. After the mastoid is exposed, the tip is opened with rongeur forceps. When the cells have been cleaned up to the antrum and this cavity has been opened, the solution is introduced and left until the field is thoroughly cleansed.

O. M. ROTT.

SURGERY OF THE NOSE, THROAT, AND MOUTH

THROAT

Coates, G. M., and Raskin, M.: *The Technique of Tonsillectomy in Use at the Camp Hancock Army Hospital, 1918.* *N. York M. J.*, 1920, cxi, 92.

The author gives credit for the first description of the method which is the subject of this article to Lewis of Jefferson Medical College. The excellences claimed for it are that its technique is simple and can be executed quickly, it is applicable to local or general anaesthesia, and it shortens the convalescence. The authors have never noted primary or secondary hæmorrhage or any other complications consequent to its use.

After a hypodermic of morphine and atropine in the cases of nervous patients, 10 per cent cocaine hydrochloride is slowly applied to the plicæ, the anterior pillars, the base of the uvula, the pharynx, and the base of the tongue, and an applicator dipped in 10 per cent cocaine is inserted for several minutes between the base of the tongue and first one and then the other tonsil. The point for hypodermic injection is the midpoint of the anterior pillar. After the application here of $3\frac{1}{2}$ per cent of iodine, a straight hypodermic needle is inserted just beneath the anterior pillar, inclined laterally, and pushed in 1 or 2 cm., the fluid being lodged between the capsule and the superior constrictor muscle. The anæsthetic of choice is 2 c.c. of apothesine in normal salt solution and several minims of adrenalin chloride 1:1,000, but 0.1 of 1 per cent cocaine, 1 per cent novocaine, or even normal salt solution may be used. Injections may be made into both tonsils at once. Inability to articulate is evidence that good anaesthesia has been obtained.

The incision is begun and continued at all times just within the tonsillar tissue. The cut begins just back of the lower part of the anterior pillar, follows this upward, and sweeps over the grasp of the forceps and down to the base of the tonsil just anterior to the posterior pillar. The depth of the cut is sufficient to insure the eversion of the tonsil. For the anterior incision the knife is held as nearly as possible across the fauces from the opposite corner of the mouth in order to undermine the anterior pillar, and any obstructing plica triangularis is cut. At the superior pole of large submerged tonsils the cut is deepened. The posterior incision is made comparatively shallow in order to avoid injury to the palatopharyngeus muscle.

In the second step of the operation the released forceps are threaded through the snare loop and re-applied more deeply in the tonsil, the upper blade preferably in the upper incision. The forceps hand holds the snare with the little finger. Next, the

depressor is withdrawn and the snare, transferred to the other hand, encircles the lower pole. The tonsil is everted by traction medianward with the forceps and gentle pressure with the snare loop against the pillars. Having been severed with the snare, it is then removed inside out and with the capsule intact.

In the cases reviewed the greater number of fossæ were practically dry and in no cases was ligation necessary. The tendency to bleed is easily controlled by inserting between the pillars a gauze sponge saturated in equal parts of the tinctures of ferric chloride and iodine and the compound tincture of benzoin. Such sponges may be left in place for hours.

Postoperative treatment was limited to soft or liquid diet of 1,500 calories for two or three days, a tepid gargle of a 1:4,000 solution of potassium permanganate every three hours, and at times the experimental application of a 5 per cent solution of dichloramine-T in chlorcosane oil twice a day.

J. D. COOK.

Bishop, W.: *Tonsillectomy.* *J.-Lancet*, 1919, n.s. xxxix, 644.

The author deplors the great number of incomplete tonsillectomies performed, gives his own technique, and draws attention to several points necessary to prevent leaving portions of tonsil tissue behind.

The instruments used are a scalpel, a Lee-Hurd combination dissector and pillar retractor, a tonsil forceps, a tongue depressor, hæmostats and sponge holders, and a snare. General anaesthesia is reserved for children and nervous adults. Local anaesthesia is induced by a few injections (10 minims) of $\frac{1}{4}$ per cent cocaine solution to which adrenalin chloride may be added (1 drop of a 1:1000 solution to 4 c.c. of cocaine solution).

The initial incision extends along the free margin of the anterior pillar in its entire length, cutting through the plica tonsillaris which spreads over the edge of the pillar onto the face of the tonsil. The plica having been cut through, the scalpel is slipped under the edge of the anterior pillar, between it and the capsule of the tonsil, and inserted to a depth of $\frac{1}{2}$ in. The pillar is then separated from the capsule by a sweeping excursion of the scalpel. This having been done, the anterior pillar is retracted outward with a retractor, the glistening capsule of the tonsil being exposed to view. This is then grasped firmly in the tonsil forceps, care being taken to include the uppermost portion. The forceps once applied should not be removed until the operation has been completed. The tonsil firmly grasped in the forceps is then pulled downward and forward toward the

center of the mouth, and by a sweeping excursion of the dissector made to follow its contour is separated from the connective-tissue anchorage. On reaching the top of the tonsil, the delicate posterior pillar is separated from the capsule by pushing the dissector backward and downward close to the tonsil and following its contour. The operation is completed with the snare.

The three sites where tonsil remnants are found most frequently and which therefore should be carefully inspected are: (1) the so-called velar lobe of the tonsil high up under the anterior pillar; (2) the back of the anterior pillar; and (3) at the base low down near the tongue.

O. M. ROTT.

Gill, E. G.: The Technique for Enucleation of the Tonsils with Local Anæsthesia: Report of Two Interesting Cases with Pleasing Results. *Laryngoscope*, 1919, xxix, 715.

The technique employed by Gill in the enucleation of tonsils under local anæsthesia is as follows:

Twenty minutes prior to the operation, while still in his own room, the patient is given a hypodermic of 1/6 gr. morphine sulphate with 1/180 gr. atropine sulphate. At the end of twenty minutes he is brought to the operating room on a carriage and placed on the table in a semi-reclining position. A small amount of 10 per cent cocaine is then applied by means of a cotton applicator to the posterior two-

thirds of the tongue and the outer surface of the tonsils. Next, a solution of 1 per cent procaine, 4 drams of which contain 10 minims of 1:1000 adrenalin chloride, is injected into the base of the tonsil, the space between the posterior pillar and the tonsil, the superior pole of the tonsil between the tonsillar tissue and the mucous membrane of the plica, and between the anterior pillar and the tonsil. After the solution has been injected first into the right and then into the left tonsil, the right tonsil is grasped with a curved, mouse-tooth, scissor-handled forceps with narrow blades about 2 inches long. One of the most important steps in the operation is the securing of a firm grasp on the tonsil. This is best done by firmly planting the upper blade of the forceps into the capsule just below the upper angle of the converging pillars, inserting the lower blade to the same depth in the inferior flexion of the capsule, and then locking the handles. Traction is now made on the handle of the forceps and the tonsil pulled up and out. Next, a small snip is made with the scissors at the upper angle where the tonsillar capsule and the converging pillars meet. The posterior pillar is then separated, and to separate the anterior pillar the blades of the scissors are opened and the right blade is carried around the anterior surface of the tonsil. To separate the tonsil from the fossa a Hurd separator is used and the operation is finished with a Tyding snare.

O. M. ROTT.

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SURGERY OF THE EYE AND EAR

Eye

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SURGERY OF THE NOSE, THROAT, AND MOUTH

Nose

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Postoperative nasal hæmorrhages. A. PUGNAT. *Rev. de laryngol.*, 1919, xl, 621.

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The tonsil in relation to infectious processes. D. J. DAVIS. *J. Am. M. Ass.*, 1920, lxxiv, 317.

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The technique for enucleation of the tonsils with local anæsthesia; report of two interesting cases with pleasing results. E. G. GILL. *Laryngoscope*, 1919, xxix, 715. [411]

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The control of hæmorrhage following removal of the tonsils. I. MOORE. *Proc. Roy. Soc. Med.*, Lond., 1919, xiii, Sect. Laryngol., 9.

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Mouth

Systemic conditions due to oral infection. H. BROWN-STEIN. *Dental Cosmos*, 1920, lxii, 89.

Pyorrhœa—its causes and cure. RYAN. *Am. J. Clin. Med.*, 1920, xxvii, 28.

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INTERNATIONAL ABSTRACT OF SURGERY

JUNE, 1920

ABSTRACTS OF CURRENT LITERATURE GENERAL SURGERY—SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE

Soresi, A. L.: Hæmostasis Obtained with Small Rubber Bands Instead of Ligatures. *N. York M. J.*, 1920, cxi, 96.

It is claimed by the author that rubber bands are preferable to ligatures except where they may become the center of a calculus as in the bladder. The band is slipped over the artery forceps and boiled with the instrument. The vessel having been caught in the usual way, the band is dislodged from its seat over the hinge with the thumb forceps and slipped to rest around the vessel. Unlike a ligature, the band cannot slip, cut, or come untied. Moreover, it can be applied more rapidly and effects hæmostasis more readily, as it requires no tying or cutting.

The author claims that pure rubber is better tolerated by the tissues than any other material. As the technique in the use of rubber bands eliminates contact with the hands, infection is impossible. Rubber bands are cheaper than ligatures and when they are applied the stumps do not slough.

M. J. GELPI.

Rouffart, E.: The Value of the Various Laparotomy Incisions in Gynecology and Obstetrics (De la valeur de différentes incisions dans les laparotomies en gynécologie et en obstétrique). *Arch. mens. d'obst. et de gynéc.*, 1919, viii, 577.

Rouffart states that the anatomical structure of the abdominal wall gives at least a theoretical superiority to transverse incisions. The most important question to be considered as regards any abdominal incision is eventration. In debilitated women who suffer from malnutrition or the effects of a malignant tumor, nephritis, syphilis, or other condition the vertical laparotomy is often followed by rupture of the abdominal sutures and intestinal hernia. Surgeons who have used the Pfannenstiel incision, on the other hand, have not observed such eventrations.

By substituting closure in four planes for closure in one plane, Winter of Berlin decreased the incidence

of eventration from 50 to 8 per cent. Most eventrations occur when a primary union is not obtained.

In transverse incisions which heal by first intention the percentages of eventration have been low, varying from 3 to about 6 per cent. Rapin collected 3,139 cases of transverse incisions in which there were only 7 cases of hernia and in this article Rouffart reviews 1,506 cases in which postoperative hernia occurred in only 0.33 per cent.

Rouffart sums up his study as follows:

1. While meeting all the exigencies of operation, the median longitudinal laparotomy incision in some cases gives rise to eventration. This sequela is especially frequent in wounds uniting by secondary intention.
2. Every median longitudinal incision should be sutured in such a manner that the scar is reinforced by the recti muscles.
3. Lateral longitudinal incisions which divide the muscles and disturb their nutrition by sectioning the nerves should be rejected as they predispose to eventration.
4. Because of its superiority from the anatomical and clinical viewpoints the transverse incision is to be preferred to the longitudinal incision in the majority of gynecological and obstetrical laparotomies.

W. A. BRENNAN.

ANÆSTHESIA

Rood, F.: Anæsthesia in Throat and Nose Operations. *Lancet*, 1920, cxcviii 433.

The author advocates ether as the proper anæsthetic for operations upon the nose and throat. There are two degrees of anæsthesia, deep and light. In the former the reflexes are gone, the pupils are dilated, the light reflex is absent, and the respirations are shallow and regular. In light anæsthesia there is muscular relaxation and regular respiration but the laryngeal and pharyngeal reflexes are still present. In this type the patient is able to cough up blood and in some cases there may be a

spasm of the cords with marked dyspnoea. The author therefore advocates the deep anaesthesia. He describes a method by which it can be induced in from six to eight minutes with a saturated wad of loose gauze similar to the Clover inhaler.

This method has a special application in otorhinolaryngological surgery. By its use inhalation of blood due to the absence of pharyngeal and laryngeal reflexes is prevented and postnasal packs become unnecessary. The annoyance of churned-up blood caused by the return blast of air in the intratracheal insufflation method is also avoided. In tonsil and adenoid surgery this deep ether anaesthesia is preferable when the nasopharynx is made dependent by raising the shoulders and bending the head back. It gives the operator a quiet field and ample time to stop haemorrhage. It is advantageous also in laryngeal work when there is danger of spasm of the cords and pharynx. In cases of obstruction due to a tumor, however, chloroform may be indicated to avoid the congestion caused by ether.

W. J. GREENFIELD.

Dowman, C. E.: Local Anaesthesia in Neurosurgery, with Special Reference to Its Value in Evulsion of the Sensory Root of the Gasserian Ganglion. *J. Am. M. Ass.*, 1920, lxxiv, 382.

Local anaesthesia is now being employed in every branch of surgery. Until recently its application to brain surgery was strictly limited, but the experience of the war so greatly widened its field that at the present time it is used successfully for such operations as subtemporal or cerebellar decompression, drainage of brain abscesses, elevation of depressed skull fractures, exploration for tumors or cysts, laminectomies, operations on the peripheral nerves, and the removal of the gasserian ganglion. By means of it the danger of haemorrhage and shock is almost entirely eliminated.

The author uses a 0.5 per cent procaine solution each ounce of which contains 15 minims of adrenalin 1:1,000. This he injects by means of a long needle and a Luer syringe with a capacity of at least 20 ccm.

In operations on the gasserian ganglion and its roots the first injection is made through the scalp above the galea and followed by massive infiltration along the field of operation. The skull can now be entered painlessly and, as is well known, the dura and brain are insensible to pain. The dura is gently retracted, the middle meningeal artery exposed and clamped, and the mandibular branch of the ganglion exposed. As the foramen ovale is reached the third branch is injected and by following its course the ganglion itself is anaesthetized. The sensory root can now be avulsed without any discomfort to the patient whatsoever.

While as a rule the dangers of the method are slight and the advantages are great, the procedure is not advocated for children or very nervous adult patients.

LOUIS HANDELMAN.

SURGICAL INSTRUMENTS AND APPARATUS

Watson, E. W.: An Instrument for Illumination and Suction in Certain Suprapubic Operations. *J. Am. M. Ass.*, 1920, lxxiv, 389.

The author describes an instrument which he devised for illuminating the bladder and emptying it of blood or urine during operations in which a full view of the operative field is necessary as in resections of the bladder wall, transplantations of the ureter, etc.

The instrument consists of a lamp carrier which is inserted in place of the obturator after the introduction of the cystoscope, and of a section channel at the outer end of which is a connection for the attachment of a suction pump.

HORACE BINNEY.

SURGERY OF THE HEAD AND NECK

HEAD

LeCount, E. R., and Apfelbach, C. W.: The Pathologic Anatomy of Traumatic Fractures of Cranial Bones and Concomitant Brain Injuries. *J. Am. M. Ass.*, 1920, lxxiv, 501.

The authors report the autopsy findings in 504 cases of fracture of the skull with injury to the brain. About 85 per cent of the cases were simple linear fractures with branches. In the remainder the bones were extensively comminuted and some of the fragments were depressed. While the bones of the cranial base were involved slightly more than those of the vault, both were involved in varying degrees in all but about 8 per cent of the cases. When grouped according to the fossae chiefly affected, the incidence was as follows: posterior fossae, 178; middle fossae, 166; anterior fossae, 61; vault, 49.

Of the injuries of the brain concomitant with fracture of the cranial bones those of the outside of the brain were most frequent, owing partly to the in-bending of the cranial bones, but chiefly to the bumping of the brain against the bones.

When the brain is bruised subdural traumatic haemorrhages result most frequently from lacerated cerebral veins. The cortical vessels also are often bleeding and torn.

The most frequent change noted in autopsies on patients dying from fracture of the skull was traumatic oedema of the brain, and in a few cases this was the only change of sufficient importance to explain the death. As in other forms of oedema of the brain, the convolutions are flattened, the cerebral veins relatively empty and flattened, the peripheral ends of the sulci closed up more or less tightly, and the fluid in the leptomeninges is greatly lessened.

When the œdema is marked, the visceral layer of the arachnoid is dry and finely granular.

The authors give the histories of the cases with illustrations and measurements of the fractures and blood clots.

H. A. McKNIGHT.

Adson, A. W.: The Surgical Treatment of Gummatous Osteitis of the Skull. *J. Am. M. Ass.*, 1920, lxxiv, 385

Gummatous osteitis occurs in late syphilis and involves the outer table of the skull alone or the outer and inner tables plus the dura and the brain. The gumma may be an isolated condition, but is more apt to be associated with numerous lesions on the skull. These lesions vary in size from 0.5 to 4 cm. The smaller ones present a fluctuating mass, while those which are larger are necrotic suppurating ulcers of the bone and usually open spontaneously.

In addition to specific treatment, local surgical treatment consisting of the removal of the sequestrum or dead bone is necessary. The author reports a case of brain abscess in which wound infection developed after operation and resulted in retraction of the skin edges and exposure of the parietal bone over an area measuring about 9 by 6 cm. Considerable difficulty was being encountered in effecting granulation when the child accidentally bumped its head, loosening the outer table of the exposed bone. This was then lifted off and granulation quickly followed.

The same principle has since been applied in 4 cases of gummatous osteitis. That is, the skin margins were elevated and freshened and the necrotic bone was removed with a chisel or rongeur to a depth where living bone was exposed. After the removal of the sequestrum, wet dressings saturated in either boric acid or saline solution should be applied. If granulation is slow after this, resort may be had to skin grafting.

In a brief summary the author suggests that similar treatment be applied also to areas of denuded bone in non-luetic cases since granulation will always be hastened by the removal of the outer table of the skull.

Henschen and Nager: Operation by the Paranasal (Transthmoid) Route in Cases of Hypophyseal Tumors; Remarks on the Surgery of the Base of the Brain (*Die paranasale (transthmoidale) Operation des Hypophysen Tumors nebst Bemerkungen zur Chirurgie des Schadelbasis*). *Cor.-bl. f. Schweiz. Aerzte*, 1919, xlix, 1289.

The authors give a résumé of the various surgical methods employed to remove hypophyseal tumors as well as those used in operations involving the base of the brain in general. They mention especially the transthmoid method, the septal method of Hirsch. This was used in 60 reported cases, 35 of which were operated upon by Hirsch himself. The mortality was only 13 per cent while in cases operated upon by the Schloffer-Eisberg method

it was 35 per cent. In 39 sublabial septal operations performed by Cushing there was only 1 death.

The authors give also the details of a case operated upon by Chiari's paranasal transthmoid method. The patient was an electrician 30 years of age who for some time had noticed that his hands and feet were increasing in size. This change was associated with loss of appetite, nervous disturbances, fatigue, headaches, and progressive sexual impotence. Examination revealed general thickening of the bones, especially those of the cranium and extremities, marked adiposity, atrophy of the testicles, and bitemporal hemianopsia. Three months later there was a lacteal secretion from both breasts which chemical examination showed to be quite similar to woman's milk. A roentgenological examination demonstrated marked thickening of the bones of the head, abnormal enlargement of the sinus cavities, and considerable enlargement of the sella turcica.

A left paranasal (transthmoid) operation was done under local anæsthesia. Hæmorrhage was not excessive and there was no pain except at the moment when the sphenoid sinus was trephined. When this sinus was opened a few cubic centimeters of brownish-yellow fluid escaped. The sella turcica was cleared by a few strokes of the curette, a tampon of iodoform gauze was inserted and brought out through the left paranasal fossa, and the paranasal incision was sutured.

There were no postoperative complications. After the first month marked improvement occurred in both the subjective and the objective symptoms. The feet, hands, head, and breasts became smaller and the general adiposity decreased. A roentgenographic examination showed that the sella turcica had contracted in all its dimensions and that its fundus, which had been thinned, had become thicker. Twenty months after the operation the patient's general condition was excellent in every respect.

The histological examination of the tissue removed by the curette showed that the hypophyseal tumor was a benign adenoma.

W. A. BRENNAN.

Gillies, H. D.: Plastic Surgery of Facial Burns. *Surg., Gynec. & Obst.*, 1920, xxx, 121.

The character and the extent of burn disfigurements are in direct proportion to the intensity and duration of the heat applied. Acid burns are usually deep burns of small area, the intervening parts being affected only a little or not at all. In flame burns of the face the eyelids are most often affected, the area next frequently involved being the bridge of the nose. Ectropion due to contraction of the eyelids is the first deformity to appear. In very severe burns the eyelids may be entirely burned away. Corneal ulcers are common. The eyebrows, forehead, and malar regions are vulnerable points. Burns about the mouth produce two forms of deformity; the angles of the mouth may be drawn down or a firm circle of scar tissue may be formed.

The author offers no data as to the best treatment for early burns. In the healing stage, however,



Fig. 1. Gillies' postauricular flap for cheek replacement.



Fig. 2. Large Wolfe graft from buttock to right cheek.



Fig. 3. Large chest flap applied to face with two tube-pedicles. The left pedicle has been divided.

fibrosis is reduced by diathermy, ionization, massage, and protection with a greased mask.

The best time to begin plastic treatment is when the scar has ceased to contract. The various areas requiring replacement are taken care of as follows:

The forehead is replaced by a Wolfe graft. The eyebrows are grafted by taking a strip of scalp from the mastoid region deep enough to contain the hair follicles. Movable eyelids are provided by the author's epithelial outlay operation. The nose is covered with a Wolfe graft and the scar tissue about the deformity is utilized to form the lining of the vestibule. In some cases a flap brought up from the neck or chest is applied. For the upper lip a hair-

bearing strip from the scalp is used. The cheek, chin, and lower lip are replaced by transferring a large flap of skin from the neck and chest by stages. In the hand, scar tissue should be replaced with healthy skin.

The flap operation may be done either by swinging up a flap with a broad-pedicle base or by the author's tube-pedicle operation which insures a better blood supply. This procedure consists in outlining a flap the size required on the neck or chest and making two parallel incisions. The area is then undercut until it is free from the underlying tissues and attached only above and below. The two free margins are turned forward and sewed

together accurately and the cut margins of the wound are brought together with tension sutures. Two or three weeks later the flap is raised from the chest and grafted to the area on the face. Later the pedicle is cut away from its original attachment.

In case of doubtful viability of the grafts, continuous warm moist applications are indicated.

I. E. BISHKOW.

Blair, V. P.: An Operation for Advanced Carcinoma of the Tongue or Floor of the Mouth. *Surg., Gynec. & Obst.*, 1920, xxx, 149.

Clinical observation has led the author to the conclusion that in spite of their high mortality, the majority of carcinomata of the mucosa of the mouth and upper air passages are not very malignant for some time after their appearance and that the present high mortality rate is due chiefly to late or inefficient operation or both. Most of the cases surgeons are called upon to treat are so far advanced as to require the more radical operations and many are not properly operable by any of the classic procedures. It was the latter type of cases of cancer of the tongue and floor of the mouth that led the author to a plan of operation which in its thoroughness may be compared to the radical operation for cancer of the breast.

Blair believes that his operation is properly applicable to the more advanced cases, especially those in which the jaw, the floor of the mouth, or the base of the tongue are involved, those in which there is palpable involvement of the submaxillary nodes, and early cases in which, after removal by a less radical procedure, examination reveals a high grade of malignancy. It has a lower death rate than any of the procedures in which the jaw bone is cut through. It is easily and quickly done and gives speech results that compare favorably with partial removals. After total removal of the tongue, however, chewing is impossible and deglutition is very much impaired. The technique of the author's operation is as follows:

Forced fluids are given for twenty-four hours before operation and a low bloodless tracheotomy is done. The use of a local anæsthetic is preferred as if a general anæsthetic is given before the tracheal tube is inserted septic material may be aspirated. The tracheal tube should be large, at least a No. 6, and long enough to reach well into the trachea. No attempt is made to clean up the inside of the mouth before operation.

The first incision skirts the lower border of the hyoid bone and goes just through the platysma muscle. With two sharp rake retractors, the skin and platysma above the incision are avulsed forcefully upward from the deep cervical fascia, the more resistant strands of tissue and the blood vessels being cut until the lower border of the mandible and the facial vessels crossing it are well exposed. At the border of the jaw the facial artery and vein are caught with two forceps, cut, and tied above the normal site of the buccal node lying on the vessels.

At the level of the skin incision the facial vein is divided between ligatures and after the submaxillary salivary gland at its lower border is freed it is drawn forcefully upward until the facial artery is well exposed as it emerges from beneath the upper border of the digastric muscle to enter the gland. As far as possible from its origin, an inch from the digastric if practicable, the artery is caught between two forceps, cut, and ligated. A search is then made for branches of the facial arising within $\frac{1}{2}$ in. proximal to the ligature. There are usually two, a very small one and a larger one. These are ligated. Just below the outer part of the digastric tendon the fibers of the hyoglossus muscle are separated by thrusting in the points of dissecting scissors, and the lingual artery is grasped and ligated.

Excision is then done with a cutting cautery, starting at the symphysis and cutting through the digastrics, geniohyoids, geniohyoglossi, and myohyoid muscles and stripping the periosteum and mucoperiosteum from the inner surface of the jaw. If the ulcer approaches the bone, prolonged cooking with a heavy cautery is done. The tongue is next drawn out through this opening which brings the pillars and the pharynx into plain view and the excision is guided by the position and extent of the growth. Finally the base of the tongue is cut across at the hyoid bone and at this time it is also well to remove the lower part of each parotid gland on account of the closely associated lymph nodes.

The lower border of each digastric muscle is sutured to the anterior border of the sternomastoid with fine tannated gut, and the ligated facial artery stumps are left standing out free in the pharynx. As a rule moderately enlarged cervical nodes tending to protrude from between the sternomastoid and the digastric muscles are not removed, but the sternomastoid is somewhat freed so that it can be sutured over these to the digastric. Before the external wound is closed a large catheter is passed through one nostril into the pharynx and fastened to the upper lip by a strip of adhesive plaster $\frac{1}{2}$ in. wide. After the excision the larynx drops very low and unless the catheter is guided by a finger in the pharynx, it is apt to enter the glottis. The external wound is closed without drainage with silkworm-gut mattress sutures that insure deep approximation of the skin and platysma. The cut or burned surface of the parotid is not included in the approximation as the secretion causes suppurative and induration. The floor of the mouth and all other raw surfaces are covered with a pack of broad strips of iodoform gauze into which balsam of Peru is thoroughly incorporated. This pack is left in place several days and then renewed as necessary until the sloughs separate.

The patient is put to bed in a semi-sitting posture. Proctoclysis is instituted and fluids are given through the nasal tube as soon as tolerated. Frequent inhalations of benzoin-steam, small doses of iodides to loosen secretions, and morphine are prescribed when necessary.

The tracheal tube is retained until danger of edema or respiratory interference from the packs has passed. Before the tube is removed a cork is inserted into it for twenty-four hours. Usually after ten days the patient is able to make very effective efforts to swallow but only water is given until it is certain that no fluid enters the glottis. When this has been demonstrated the nasal feeding tube is removed.

The operation is to be followed later by the radical dissection of the lymph-bearing areas of both sides of the neck.

G. W. HOCHREIN.

NECK

Sistrunk, W. E.: The Surgical Treatment of Cysts of the Thyroglossal Tract. *Ann. Surg.*, 1920, lxxi, 121.

Very early in foetal life, before the hyoid bone is formed, the thyroid gland develops at the base of the tongue and descends in the midline of the neck to its normal position. Ordinarily the epithelial lining of its tract of descent disappears early in foetal life but occasionally it is not obliterated and thyroid tissue or cysts develop along its course. It is probable that quite often the portion of the duct above the hyoid bone persists and the secretion of its epithelial lining passes directly into the mouth through the foramen cæcum. In such cases, if the foramen cæcum becomes blocked, accumulating fluid will travel downward, following the tract made by the descending thyroid, and form a tumor in the midline of the neck near the hyoid bone.

This process explains the occurrence of thyroglossal cysts in adult life. The diagnosis of such cysts is usually not difficult. They occur as rather firm, cystic tumors in the midline of the neck near the hyoid bone or thyroid cartilage. The duct from the cyst may be palpated to the hyoid bone. If left alone, the cyst gradually enlarges until surgical drainage becomes necessary or, as the result of infection, an abscess forms which requires drainage. In either case a sinus will persist and discharge the fluid secreted by the epithelial lining of the tract.

The majority of the operations for the cure of thyroglossal cysts are unsuccessful because the epithelial lining of the tract from the cyst to the foramen cæcum is not removed completely. The chief difficulty lies in dissecting out that very fragile portion of the duct between the hyoid bone and the foramen cæcum. The author has overcome this difficulty by an operation which he performs as follows:

A transverse incision about 2 in. in length is made across the neck at about the level of the hyoid bone and the skin and platysma muscle are reflected. The cyst is found lying beneath the raphe connecting the sternohyoid bone. At this point the tract usually goes through the hyoid bone, although in some cases it passes above or below it. The muscles attached to the center of the hyoid are separated

and about $\frac{1}{4}$ in. of the bone is removed. Then, without any attempt to isolate the duct, the tissues are cut through from this point directly to the foramen cæcum. With the duct, the tissues surrounding it for a distance of about $\frac{1}{8}$ in. on every side are removed. In order to do this the line to the foramen cæcum must be followed accurately. This line corresponds to one drawn at an angle of forty-five degrees backward and upward through the intersection of lines horizontal and perpendicular to the upper central portion of the hyoid bone. The dissection removes with the duct a portion of the hyoid bone, a portion of the raphe joining the mylohyoid muscles, a portion of each geniohyoglossus muscle, and the foramen cæcum.

The opening into the mouth is closed and several sutures are used to draw the geniohyoglossus muscles together. The tissues surrounding the cut ends of the hyoid bone are brought together with chromic catgut sutures in such a manner as to approximate the edges of the bone. A small rubber tissue drain is then introduced down to this point and the skin closed around it.

It is probably best to inject the sinuses with some dye, such as methylene blue, in order that any lateral branches which may be present between the hyoid bone and the foramen cæcum may be recognized and removed.

The author has never seen ill effects follow the removal of a portion of the hyoid bone nor any infection of a serious character due to the opening made into the mouth.

G. S. FOULDS.

Schwytzer, G.: The Diagnosis and Surgical Treatment of Intrathoracic Goiter; Palliative Tracheotomy; Tracheostenosis. *J. Am. M. Ass.*, 1920, lxxiv, 597.

The term "intrathoracic goiter" indicates in a general way that the thyroid growth is located in the chest. Woelfler classified these goiters as substernal, subclavicular, and endothoracic. Other writers refer to them as partial or total intrathoracic goiters.

In the series of goiters which form the basis of this paper there were no endothoracic or total intrathoracic goiters; all were complicated by a goiter on the neck itself. Only goiters reaching to the second rib or lower are considered.

As an aid to the diagnosis of an intrathoracic goiter, the patient's history is of considerable value. He may state that he had a goiter for years and that it disappeared or was "cured." Breathing may have been difficult on the least muscular effort and this difficulty may have remained even after the disappearance of the goiter on the neck. In addition he may state that when in bed he is forced to lie in a certain position and that sometimes he spends night after night in a chair because of difficulty in breathing when he lies down.

Such a patient frequently carries his head high and stiffly or bent forward with the chin approaching the sternum.

On examination, percussion may reveal a distinct dullness over the sternum, over the sternum and one side, or over both sides. This symptom is more constant than the findings of auscultation. The breathing in the upper chest may be so light and superficial that it attracts attention. The lung may be so squeezed to one side that it cannot inflate. A bronchus may be compressed. There may be resistance to palpation in the jugulum which is constant or noticed only during deglutition. The larynx may be very low and its excursion during deglutition markedly reduced. If hoarseness is present the laryngoscope will reveal paresis or paralysis of the vocal cord. The lower part of the trachea should be included in the laryngoscopic picture as well as the vocal cords.

At times there are symptoms originating from the special pathologic structure of the goiter and these also must be considered. The malignant intrathoracic goiter in its initial state is of course intracapsular and cannot be diagnosed. If there is severe dyspnoea, and especially if the recurrent laryngeal nerve is paralyzed and a metastatic tumor is found, the diagnosis becomes certain but a cure impossible. Fortunately, most of the intrathoracic goiters are benign.

The relation between the goiter and the heart has long been recognized. A toxic goiter or the pronounced exophthalmic goiter is responsible for the thyrotoxic heart, but another important heart affection found more commonly in intrathoracic goiter is the "mechanical goiter heart." On examination the valves are found free from murmur.

Usually the heart appears to be enlarged, but because of dullness its outlines are indistinct. The heart action is confused, irregular, and accelerated.

A very characteristic symptom of intrathoracic goiter is the network of dilated veins on the anterior aspect of the neck and upper chest. Because of the pressure exerted on the superior vena cava its blood is now drained through side channels into the inferior vena cava.

The operability of a case of intrathoracic goiter depends on the heart rather than upon the degree of dyspnoea, the pressure on the nerves, or the symptoms. A degenerated heart muscle, a pronounced myocarditis bringing on secondary changes of the other inner organs, is a contra-indication to operation. A retrosternal goiter with its precarious dyspnoea should be operated on without delay.

The patient must be kept as quiet as possible. If during the operation the dyspnoea increases so that life is endangered a tracheotomy must be done and a cannula of sufficient length introduced to reach beyond the point of obstruction.

The tumor itself must be bluntly enucleated from its capsule and careful attention must be given the blood vessels. The author always begins goiter excisions by tying off the upper horns. After the removal of the tumor he drains every cavity.

Fourteen of the author's patients were women and 2 were men. All of the goiters were benign. One was a double cyst, two were distinctly toxic, one was exophthalmic, and the others were colloid, parenchymatous, or cysto-parenchymatous goiters,

G. W. HOCHREIN.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

McCulloch, H., and Fischel, W.: The Care of Penetrating Wounds of the Chest at a Base Hospital. *Mil. Surgeon*, 1920, xlvii, 59.

This report is based on the cases studied by the authors in 1918 at British General Hospital No. 12. Rarely did they see a chest wound less than forty-eight hours old. Theoretically the worst cases were kept at the casualty clearing stations.

The authors conclude that each case must be considered individually and the treatment adapted to meet its special requirements. As their experience grew they became more conservative in advising surgical interference though they still remained convinced that in some cases radical measures were indicated.

The number of cases studied was 539. Fifty-seven of these patients had penetrating wounds of the chest and diaphragm; 8, wounds of the chest and complete severance of the spinal cord; and 474, chest wounds only. The mortality was 8.16 per cent in the first group, 24.6 per cent in the second, and 4.64 per cent in the third.

In all the cases in which the presence of fluid was even suspected aspiration was done and repeated in from twenty-four to forty-eight hours depending on the character of the aspirated fluid and the patient's condition.

All fluids were examined for bacteria. The authors firmly believe that more of these cases would have come through without drainage if aspiration has been done systematically for several days following a primary thoracotomy.

Drainage tubes were adjusted according to the particular requirements of the case. Irrigation of the pleura with eusol or Dakin's solution was done only when especially indicated. E. C. ROBITSEK.

Aschner, P. W.: Acute Empyema of the Thorax Treated by Minor Intercostal Thoracotomy. *Surg., Gynec. & Obst.*, 1920, xxx, 154.

During a period of ten years (1903-1913) 258 cases of acute empyema were treated at the Mount Sinai Hospital by thoracotomy with rib resection. Drainage was established by means of two large rubber tubes and the dressings were changed as often as the amount of discharge made it necessary.

Fifty-nine of the patients (23 per cent) died. Fifty-seven per cent were cured by the primary operation and 20 per cent not cured.

To obtain better final results in empyema of the thorax and to prevent the formation of persistent sinuses and cavities and fixation of the lung in an unfavorable position, Lilienthal proposed the operation of major intercostal thoracotomy which permits free, wide exploration and thorough mobilization of the lung. When, in the cases reported, the patient's condition rendered this operation inadvisable as a primary procedure, a small intercostal incision was made and a single tube inserted, the more extensive operation, if deemed necessary, being undertaken a few days or weeks later.

Aschner's report covers 71 cases of acute empyema treated by the minor intercostal incision during a period of fifteen months (January 1, 1918, to April 1, 1919) on the surgical services of Lilienthal, Berg, and Beer.

In all cases except those of immediate urgency an X-ray examination of the chest with the patient in the upright position was made before operation and preferably before exploratory aspiration. Aspiration before the X-ray examination was deemed inadvisable as occasionally it admitted air into the pleural cavity which confused the picture. In many cases aspiration had been done before the patient entered the hospital and in 2 instances submuscular abscesses had developed as a result of leakage along the needle track, i.e., induced empyema necessitatis.

The operation described is so simple and requires so few instruments that the patient need not be moved from his bed. In 32 of the 71 cases, it was done under local anesthesia; in 26, under ether; in 5, under gas and oxygen; and in 2, under chloroform. In 6 case records the anesthetic is not recorded. Local anesthesia was used for children as well as for adults. In addition to the usual infiltration with 0.5 per cent novocaine along the line of incision, some of the surgeons attempted to block the intercostal nerves by infiltrating at the borders of the ribs bounding the intercostal space posterior to the line of the incision. This was found to lessen the pain caused by entering the pleura and the discomfort due to the introduction of the drainage tube.

Aspiration was done in the posterior axillary line through the eighth or ninth space. In a few cases pus was found in the axilla. The lowest point of the pus pocket having been located, the needle was left *in situ* to mark the center of a 1.5 in. incision extending down to the muscle layers. A grooved director was then passed along the needle and the needle withdrawn. A dressing forceps was passed next and the pleural opening spread sufficiently to permit the introduction of a tube of suitable diameter with a side hole about an inch from its end. This tube was held in the grasp of a long artery forceps. As the muscle fibers were not cut they acted somewhat as a sphincter, surrounding the tube closely and preventing the entrance of air. The tube having

been introduced so that the fenestra was just within the pleura, part of the pus was allowed to escape, and the tube then clamped. The superficial wound was packed lightly, the tube secured by a safety pin and adhesive strips to the skin, and a small dressing applied. The patient was then placed in a Roth empyema bed.

In two cases, those of young infants, drainage was established by inserting a trocar and cannula under local anesthesia, threading a tube through the cannula, and then withdrawing the cannula, leaving the tube in place.

In the cases of children the postoperative treatment is greatly facilitated by the empyema bed. The child lies on the affected side on a canvas spanned across the bed frame, the drainage tube passing through a window in the canvas to an air-tight pus-collecting bottle.

The same method of draining is applied to adults by allowing the thoracic drainage tube to pass to the pus bottle between the two sections of a mattress split transversely.

The drainage tube should be changed and the wound dressed every three or four days. When large amounts of fibrin are found in the discharge more frequent changes are necessary.

Favorable progress of the case is manifested by a decrease in the temperature and in the pulse and respiratory rate, an increase in the appetite, improvement in sleep and comfort, a brighter and more cheerful aspect, a decrease in the amount and a change in the character of the discharge, a reduction in the amount of serous fluid per day to about 4 dr. (which warrants discontinuing the use of the apparatus) and fluoroscopic and radiographic evidence of expansion of the lung and the absence of retention or sacculation. Roentgen examinations are also of value in the after-care of these cases.

If the fluoroscopic examination shows expansion of the lung when the patient coughs or strains, a conservative course is indicated. In such cases persistent drainage and disinfection may result in aseptic healing of the wound and gradual obliteration of the dead space by pulmonary expansion and contraction of the thoracic walls.

If the lung is found persistently fixed in an unfavorable position and incompletely expanded, operative interference is indicated. In such cases the author prefers major intercostal thoracotomy.

The use of Dakin's solution was added to the drainage described by means of a T-tube inserted between the thoracic drain and the pus-collecting bottle. Varying amounts of the fluid (from 25 to 100 ccm.) were allowed to enter the chest every two hours by day and twice during the night. The first instillation was made slowly with a syringe containing 10 or 15 ccm. The appearance of blood in the discharge which was not ascribable to the trauma of dressing was considered an indication to stop the use of the Dakin fluid.

An effort was made to maintain the patient's nutrition at a high level by liberal feeding, and

expansion of the lung was encouraged by the use of blowing bottles. Lilienthal had the children inflate toy balloons to the mouth pieces of which were attached constricted rubber tubes which necessitated increased respiratory efforts. Fresh air and exposure to sunshine were also valuable therapeutic aids and in some very serious cases seemed to be the determining factors in the recovery.

As a result of this study the following conclusions are drawn:

The proper treatment of empyema requires the close co-operation of the internist, the surgeon, and the roentgenologist. For purposes of prognosis and treatment empyema may be divided into ordinary empyema, pyopneumothorax, and sacculated empyema. Cases due to specific infections, such as tuberculosis and actinomycosis, should not be grouped with those caused by the ordinary pyogenic organisms.

Simple intercostal thoracotomy with the method of drainage described has yielded results superior to those obtained by rib resection. As a rule it may be done under local anæsthesia and is a more simple procedure. By making possible the early use of suction drainage, it favors pulmonary expansion. It eliminates one source of chronic empyema sinuses, i.e., disease of the ribs. Rib resection and major thoracotomy are to be reserved as primary procedures for specific indications. The deforming thoracoplastic operations previously practiced have been eliminated.

G. W. HOCHREIN.

Mozingo, A. E.: The Surgical Treatment of Empyema by a Closed Method. *J. Indiana State M. Ass.*, 1920, xiii, 46.

The writer reports the results and advantages of a closed method of treating empyema, acute and chronic. In 138 cases so treated, 45 of which were chronic, the mortality was less than 2 per cent. The chief features of the method are:

1. A single, early minor operation with trocarnula, without danger of shock or collapse of the lung.

2. The intermittent removal of secretion and antiseptic treatment given through a small rubber tube with a bulb syringe.

3. Rapid partial sterilization with neutral solution of chlorinated soda (Dakin's solution) followed by complete sterilization with a 2 per cent solution of formalin in glycerin.

4. The maintenance of negative pressure in the empyemic cavity which leads to early obliteration of the cavity.

5. One dressing which will last several days and absence of skin irritation and constriction of the chest.

6. Rapid permanent cures with small scars and seldom any chest deformity.

7. A greatly lowered mortality rate.

The details regarding the technique are given and the author cites specific cases of his own and of others to show the successful results obtained.

Twenty-four points of superiority of the closed method over other methods are enumerated.

A. R. HOLLENDER.

Wessler, H.: Intrathoracic Hodgkin's Disease: Its Roentgen Diagnosis. *J. Am. M. Ass.*, 1920, lxxiv, 445.

In atypical cases of Hodgkin's disease in which external lymphomata are poorly developed or absent, an examination of the chest may furnish data which will aid in the diagnosis. As the findings are not always distinctive, however, the author studied 25 cases roentgenographically to determine the frequency of intrathoracic involvement and especially to ascertain whether the roentgenogram offers anything characteristic of the condition. He found distinct evidence of enlargement of the intrathoracic nodes or involvement of other lymphatic tissue in all of the 25 cases.

The changes noted are classified under four types: (1) mediastinal tumor, (2) infiltrative changes, (3) isolated nodules or metastases in the lung, and (4) discrete nodes at the roots of the lungs. Type 1 was present in 8 cases, Type 2 in 4, and Type 3 in 4 (invariably associated with one of the other forms of the disease). Type 4 was the most common form.

The first three types present pictures similar to those of other conditions, but the fourth is fairly characteristic of Hodgkin's disease. Often the shadows extend for a considerable distance from the roots of the lungs and individual nodes or groups of nodes retain their outline. It is characteristic of the shadows that they are faint, and in this respect they differ from those of new growths and tuberculosis. They are distinguishable from the latter particularly by an absence of caseation and calcification. Large lobulated shadows at the roots of the lungs which are faint and homogeneous are strongly suggestive of Hodgkin's disease, and the suggestion is strengthened if outlying deposits are found in the lungs. In the cases studied involvement of the right paratracheal nodes was especially common, being present in 14. As this is rare in other diseases of the chest, it is a more or less definite indication of Hodgkin's disease.

ADOLPH HARTUNG.

TRACHEA AND LUNGS

Graham, E. E.: Foreign Bodies in the Air and Food Passages. *Am. J. Dis. Child.*, 1920, xix, 119.

Graham emphasizes the following points in reference to foreign bodies in the air and food passages in children:

1. It seems reasonable to believe that cases of foreign bodies in the air and food passages of children are much more common than was formerly supposed. Statistics tend to show that about 66 per cent of cases of foreign bodies in the air passages are those of children.

2. The period of latency of symptoms which follows the violent dyspnoea and choking attack and later the gradual onset and chronic character of the symptoms may lead to failure to suspect the presence of a foreign body.

3. Foreign bodies are often overlooked, as is evident from a study of the histories of many cases.

4. The symptoms vary greatly. The peanut kernel immediately sets up a severe laryngitis, tracheitis, and bronchitis. In such cases the older child may survive the acute symptoms but almost surely will develop pneumonia.

5. Metal objects may remain in the lung for a very long time and cause comparatively little damage.

6. Some foreign bodies do not cast a shadow on the plate.

7. The location in the oesophagus of a foreign body that does not cast a shadow on the plate may often be diagnosed if the patient swallows a bismuth-filled capsule. The roentgen ray will then show the bismuth capsule held in position in the oesophagus by the foreign body.

8. Do not urge the patient to cough with the hope that in so doing he will expel a foreign body from the lungs.

9. Foreign bodies are very rarely coughed up.

10. The physical signs and symptoms vary according to the composition, form, shape, and size of the foreign body.

11. The presence of a foreign body should be suspected if the following conditions are present: an unexplained leucocytosis, localized symptoms in one lung that do not clear up under treatment, the absence of tubercle bacilli in the sputum, and gradual decrease of weight and strength.

12. There are no contra-indications to bronchoscopy except possibly extreme weakness. In such cases the patient should be given time to rally before the examination is attempted.

13. Bronchoscopy should be performed as soon as possible after the entrance of the foreign body.

14. Children do not require the administration of an anæsthetic for bronchoscopy.

15. The necessity for taking a roentgenogram in the case of every patient with a history of swallowing or inhaling a foreign body cannot be emphasized too strongly.

16. The asthmatic wheeze is a sign of considerable importance. O. M. ROTT.

Lynah, H. L.: Bronchoscopic Treatment of Bronchiectasis and Pulmonary Abscess. *Med. Rec.*, 1920, xcvi, 215.

By the use of the bronchoscope in the treatment of bronchiectasis and pulmonary abscess many patients suffering from these conditions may be relieved or even cured by the establishment of proper drainage of the lung.

In bronchiectasis, especially in cases following diphtheritic involvement of the bronchi, there is a

marked peribronchial infiltration and connective-tissue thickening of the bronchial wall which by subsequent contraction often produces stenosis. These bronchial stenoses follow not only diphtheritic tracheobronchitis, but also the sojourn of foreign bodies in the bronchi for a long period of time, influenza, syphilis, and other conditions of the mediastinum causing pressure from without, such as that due to peribronchial infiltrations and enlargement of the mediastinal glands. External pressure on the bronchus often causes a chronic inflammatory thickening of the compressed bronchial wall which later may result in stenosis.

When in cases of laryngeal diphtheria treated by intubation there is obstruction of the lumen of the intubation tube, secretions may be retained in the lungs and produce a "sponge soaking" of the lung structure. The patient being unable to expel this secretion, frequently succumbs. Such cases are often diagnosed as bronchopneumonia, but the condition is rapidly relieved by bronchoscopic evacuation of the secretion.

An unfortunate termination often follows also the aspiration of extremely irritating substances such as food and nuts, especially when a particle is deeply lodged in a small branch bronchus beyond the range of the bronchoscope. Within a short time the secretions become purulent and a lung abscess develops. This is frequently the starting point of bronchiectasis. The retention of secretions below a foreign body or bronchial stricture often follows even after the successful removal of the foreign body for the bronchus will necessarily dilate below the stricture and become a reservoir for foul secretion. However small its lumen, a bronchial stricture does not shut off the airway, but does shut off the normal expulsion of secretions. The resulting retention of foul secretions for a long period of time will lead to bronchiectasis, lung abscess, or even gangrene of the lung.

In examining cases of pulmonary abscess by means of the bronchoscope Lynah has usually found pus pouring from a small branch bronchus but at times it has been difficult definitely to locate the abscess cavity in the lung from which the pus was oozing. In a case referred to him by Bullowa, however, a definite abscess cavity was entered by a special bronchoscope 5 mm. by 45 cm. in size. This abscess was well down toward the diaphragm and connected with the left lateral branch bronchus. The mouth of the stalk of the abscess was surrounded by granulation tissue from the center of which foul-smelling pus was oozing. The 5 mm. bronchoscope entered the cavity through the connecting stalk.

When the abscess cavity is connected by its stalk to a branch bronchus which can be entered with a small bronchoscope, it can be readily drained and washed, but many treatments are often necessary before the condition is cured. In some instances considerable reaction follows such pulmonary washing, while in others there is little or no reaction or shock. In the case referred to, that of a young man,

a marked reaction was noted after each treatment. The temperature rose to 105 F. an hour after the washing and gradually fell to normal the next day. There was also much pain in the left chest in the region of the diaphragm. The patient made a complete recovery after a period of three months and has remained well ever since.

Another patient, a man 22 years of age referred by Kupferman, had had a pulmonary abscess for one year and a half. This abscess followed tonsillectomy and the inhalation of a piece of wooden tongue depressor. It was situated at a right angle to the bronchus into which it was emptying, and pus could be seen oozing from a small branch bronchus. The condition was apparently improved after 7 washings, but unfortunately the patient decided that the method was too slow and drainage by thoracotomy would result in a more rapid cure. The operation was unsuccessful and death occurred soon afterward.

Bronchiectasis resulting from bronchial stenosis is much more readily dealt with by bronchial dilatation and drainage. In one instance the right bronchus was drained and the lung aerated by the introduction into the bronchus of a long, soft, fenestrated rubber inner tube. This tube was left in place for six months. Complete recovery resulted and the patient is still perfectly well two and one-half years later.

While the bronchi may be intubated by the author's long bronchial intubation tubes, the catheterization of the bronchi through the tracheotomy tube is tolerated much better and at the same time the patient has the use of his voice.

Pulmonary drainage is difficult in all cases of circumscribed abscess, but conservative bronchoscopic measures should be given a thorough trial before radical major surgery is attempted.

Meyer, W.: The Operative Treatment of Advanced Pulmonary Tuberculosis. *Surg., Gynec. & Obst.*, 1920, xxx, 161.

The author calls attention to the great progress made in the treatment of tuberculosis by the application of artificial pneumothorax but asks what is to be done if the lung is fixed to the chest wall by adhesions. Formerly if medical and hygi-

enic treatment did not improve the condition of such patients, they were doomed. It is here that active surgery has stepped in during the last ten years. By means of extrapleural thoracoplasty it is possible to collapse the lung completely. As soon as the parts of the thoracic skeleton to which the lung is attached are removed, the lung will collapse. The operation can be done under regional and local anæsthesia by nerve blocking. It is done best with the aid of Sauerbruch's hook incision which represents the posterior half of the original Schede incision. Other operative measures are the procedure first used by Friedrich; Schede's incision and immediate removal of the ribs from the tenth to the second in one stage; and Wilms's so-called columnar resection which consists in the removal of a portion of the ribs anteriorly and posteriorly, the middle portion being used for collapse and compression.

Sauerbruch, fearing aspiration from a cavity in the upper lobe if the entire work is done in one stage, proposes a two-stage operation, the tenth to sixth ribs being resected in the first stage, and the fifth to second or first a few weeks later.

Wilms does not share this fear. Further investigations are required to determine whether it is justified or not.

The results in the series of cases reported by Friedrich, Sauerbruch, and Wilms independently of one another are almost the same and very encouraging. Two-thirds of these otherwise entirely hopeless cases were either improved, greatly improved, or cured by the operation.

Unilateral tuberculosis of the lung, particularly with cavity formation, represents the most favorable lesion for the operation, but the procedure has proved of value also when the opposite lung was involved to some extent.

Meyer reports a case in which he did an extrapleural thoracoplasty in two stages under local anæsthesia. The patient, a man 31 years of age, suffered from bilateral disease which was particularly pronounced on the left side. At the present time, six months after the operation on the left side, he is very greatly improved. The sputum is markedly reduced and free from bacilli and the cough has almost completely ceased.

SURGERY OF THE ABDOMEN

GASTRO-INTESTINAL TRACT

Lemon, W. S.: Angioma of the Stomach. *Med. Rec.*, 1920, xcvii, 220.

A case of angioma of the stomach is presented in detail. There are only 5 such cases in the literature.

The author's patient was a man, aged 67, of good habits and unimportant previous history, who complained that he had suffered from gastric distress, initiated by bloody diarrhoea, for six months.

Pain was constant and diffuse, radiating downward from the left costal arch. The patient had lost 25 lbs. and was dyspnoeic and slightly cyanotic. There had been no vomiting or hæmorrhage by mouth.

The X-ray showed a large unfilled area in the fundus. No epigastric tumor was palpable. Total acidity, 50 per cent; free acidity, 30 per cent. There was marked arteriosclerosis with hypertension. The clinical diagnosis was gastric cancer.

At operation a sleeve resection of 11 cm. of the center of the stomach and an end-to-end anastomosis were done. Convalescence was uneventful and six months later the patient was in excellent health.

P. M. CHASE.

Bartrina, J. M.: Notes on Gastric Surgery (Notas sobre la cirugía gástrica). *Arch. españ. de enferm. d. apar. digest.*, 1919, ii, 730.

Duodenal ulcer is of frequent occurrence and in position is usually juxtapyloric. Topical treatment by means of gastric lavage with healing fluids is ineffectual and as a rule is done because of difficulty in detecting the location of the lesion.

As ulcers cannot be produced experimentally, their pathogenesis remains unknown. Animals do not suffer from this affection. Among the etiological factors should be considered the alimentation to which man is accustomed. Certain ulcers are undoubtedly tuberculous although at present the proportion of this origin is not definitely known.

The greater frequency with which postmortem examinations are being performed and the care with which postoperative histories are being followed have done much in recent years to increase the knowledge of the pathologic entity of cancerous ulcer.

Gastro-enterostomy effects a cure in the majority of cases of duodenal ulcer and is generally indicated when the ulcer is juxtapyloric and especially if it is associated with pyloric stenosis. In many cases simple gastro-enterostomy is to be preferred to occlusion of the pylorus with gastro-enterostomy, the Finney operation, occlusion of the pylorus with terminolateral anastomosis, pylorotomy, or gastric resection.

The best posterior gastro-enterostomy is probably that employed by the Mayos. If there is danger of occlusion because of the small space behind the colon, however, an anterior gastro-enterostomy should be performed. The extent of a gastric carcinoma is not a contra-indication to operation provided the tumor is mobile. The technique of resection with Pair's clamps followed by terminolateral gastro-enterostomy has increased operative indications and improved the ultimate results.

W. R. MEEKER.

MacDonald, I.: Pauchet's Method of Gastrectomy. *Lancet*, 1920, cxcviii, 308.

The principal technical difficulties in resection of the stomach are high ligation of the coronary artery, the prevention of leakage from the duodenal stump, the efficient removal of lymph vessels and glands, and the avoidance of injury to the middle colic artery. The importance of the latter is emphasized.

The technique of Pauchet's operation is given as follows:

1. The great omentum is separated from the transverse colon and mesocolon by careful dissection in the avascular area between the colon and the transverse mesocolon below. The omentum and

stomach are then thrown upward, and the posterior surface of the stomach, the pancreas, and the upper surface of the transverse mesocolon exposed.

2. The stomach is carefully detached from the pancreas, the first portion of the duodenum is freed from its peritoneal confines by careful dissection, and the right epiploic and superior pancreaticoduodenal arteries are ligated. The peripyloric and duodenopancreatic glands are then pushed up with the tumor mass and the stomach.

3. The duodenum is divided and closed by two-layer sutures and an omental flap is approximated to the duodenal stump. The pyloric artery is ligated and the gastrophatic omentum divided as near the liver as possible. The stomach is then pulled to the left and the ligature of the coronary artery is placed as high as possible.

4. The lesser curvature of the stomach is cleared of its serous coat, vessels, and glands by blunt dissection from the point of ligation of the coronary artery to the tumor.

5. A crushing clamp is placed across the stomach and the diseased distal portion is severed with the thermocautery. A continuous linen suture is placed along the gastric section, its loops passing over the clamp. The ends of this suture are drawn tight with the removal of the clamp and the stomach is closed with a purse-string suture.

6. Anterior or posterior gastro-enterostomy with or without the use of a button, depending on the amount of stomach left, is then performed or the sectioned portion of the stomach is united directly to the jejunum after the method of Polya.

Pauchet sums up the advantages of his operation as follows:

1. The recognition of ulcers or other lesions which may pass unnoticed in mere superficial examination.

2. The possibility of dissecting with the greatest precision ulcers and cancers adherent to the pancreas or transverse mesocolon.

3. In cases of cancer, the greater facility with which the chain of glands lying along the terminal portion of the greater curvature, the lower aspect of the pylorus, and the first portion of the duodenum can be freed.

In cases in which the surgeon may decide to resect the mesocolon because it is invaded by the growth, the most simple and rapid method of removing the zone of the transverse colon deprived of its blood supply by the ligature of the mesocolic vessels is to extend the colo-omental separation around the hepatic angle of the colon as in mobilization of the colon. The terminal ileum is then anastomosed to the transverse colon where its vascular supply is assured.

J. A. H. MAGOUN, JR.

Flint, E. R., and Scargill, H. B.: Gastric Ulcer; A Plea for Gastrectomy. *Brit. J. Surg.*, 1920, vii, 396.

The authors accept as true gastric ulcers only lesions which show a loss of the full depth of the

mucosa and heal by fibrous tissue. This excludes the chaps, fissures, and superficial erosions which may clinically simulate gastric ulcer. During seven years at the Leeds Infirmary, 749 patients with duodenal ulcer and 329 with gastric ulcer were operated on. In the same period there were 980 operations for gall-stones. Therefore for every 6 cases of gall-stones there were 5 cases of duodenal ulcer and 2 cases of gastric ulcer. Duodenal ulcer is four times as common in men as in women, and gastric ulcer twice as common.

The causation of gastric ulcer has been attributed to many factors, chief of which is infection. In this connection the authors cite the work of Rosenow. According to Bolton the initial lesions leading to ulcer are those of localized necrosis, localized hæmorrhage, and inflammation of the lymphatic follicles of the stomach wall. The digestive properties of the gastric juice tend to prevent healing. Seventy-five per cent of gastric ulcers occur along the lesser curvature and 80 per cent in the pyloric portion of the stomach. These are the areas in which most of the lymphatic follicles are situated. In many cases the appendix may be the source of the infection.

In the authors' opinion all cases of chronic ulcer are first acute and all acute ulcers may ultimately become chronic. Reference is made to the statement of W. J. Mayo that ulcers larger than a six-penny piece are usually malignant.

The average duration of a gastric ulcer is between five and ten years. The pain may be caused or relieved by food and usually occurs from one to two hours after meals. As a rule the nearer the ulcer to the cardia the sooner the pain occurs after the ingestion of food but an obstructing ulcer at the pylorus may cause pain directly after food is taken.

Pain in the back, which usually indicates a lesion of the pancreas, occurs in 20 per cent of the old cases. Pain persisting longer than usual may mean an impending perforation or carcinoma, while pain occurring earlier than formerly after the ingestion of food indicates pyloric stenosis or hour-glass stomach. Ninety per cent of acute perforations occur during acute exacerbations of a chronic ulcer. The authors believe that the pain is due to spasm caused by the irritation of the ulcer by acid.

Vomiting occurs in more than 50 per cent of the cases and can be controlled by liquid diet and rest.

Hæmorrhage is present in less than 40 per cent of the cases. Usually it is moderate but occasionally may be severe.

Physical signs are of little value in reaching a correct diagnosis.

Sixty per cent of patients with gastric ulcer suffer with hyperacidity and 40 per cent with hypoacidity. Sixty per cent of gastric disturbances have their origin outside of the stomach, that is, in the appendix, gall-bladder, liver, etc.

The treatment of chronic gastric ulcer is always surgical. The authors advocate partial gastrectomy in which enough of the stomach is removed to in-

clude 1 in. of healthy mucosa beyond the ulcer and the side of the jejunum is anastomosed to the cut end of the stomach. The development of carcinoma, hæmorrhage, and perforation is thus avoided. Gall-stones are present in 1.5 per cent of cases of gastric ulcer, and duodenal ulcers in 2.5 per cent.

The X-ray is a great aid in the diagnosis of gastric ulcer. The authors use the procedure described by Handek in 1912. The ulcer may be recognized by the direct sign, i.e., the demonstration of the ulcer cavity, or by the indirect sign, i.e., the spasm caused by the ulcer.

J. A. H. MAGOUN, JR.

Truesdale, P. E.: The Surgical Treatment of Peptic Ulcer. *Boston M. & S. J.*, 1920, clxxxii, 135.

Many phases of peptic ulcer are more or less obscure and there is a resulting diversity of opinion regarding its diagnosis and treatment. Chronic peptic ulcer is rarely seen in its incipient stage because it is then entirely latent or regarded so lightly by the patient that he does not consult a physician. Indeed, acute symptoms generally signify an exacerbation of a chronic lesion. In 27 cases treated by pylorotomy the average duration of symptoms was seven and one-half years.

Medical treatment should be tried in the early stages, but when unsuccessful after a reasonable time the risks of hæmorrhage, perforation, and malignant degeneration must be borne in mind.

After a careful review of the history, the first step in the surgical treatment of peptic ulcer is to establish the diagnosis by direct examination of the stomach and duodenum through an abdominal incision. This is not always easy as often other changes at the pylorus simulate ulcer. The most common of these is functional hypertrophy of the pyloric sphincter, either congenital or due to continued spasm. This is fairly common in persons who suffer from gall-stones, intestinal stricture, or similar conditions. A definite ulcer cicatrix must be visible to establish the diagnosis.

In certain well-known clinics, in addition to gastro-enterostomy, excision of all accessible ulcers is done. If the ulcer is in the pyloric end of the stomach and the condition of the patient permits, pylorotomy is the operation of choice. When the patient's condition does not warrant the risk of the complete operation, gastro-enterostomy is done and pylorotomy is delayed until it can be performed with safety. The marked relief following gastro-enterostomy, however, often induces the patient to refuse the second operation until severe symptoms return. The author cites two such cases in which the second laparotomy, performed after a lapse of nine and five months respectively, disclosed inoperable cancer.

In the author's series of 27 pylorotomies for ulcer at or near the pylorus there was one death, due to leakage of the duodenal stump. In 1917, following an X-ray study of the first 17 of these cases, Lindsey wrote regarding them: "In general, the efficient manner in which these stomachs

perform their function at such long periods after operation testifies to the essential conservatism of an apparently radical operation."

Gastro-enterostomy gives the best results in cases in which there is benign obstruction at the pylorus and in such cases is a very satisfactory measure. Operation for chronic ulcer, however, cannot be performed by rule of thumb. The ulcer must be excised by some method that will maintain the complex relations of the alimentary functions. Pylorotomy, retaining as it does a one-way passage through the alimentary tract, seems an eminently satisfactory procedure for this purpose.

H. P. SAWYER.

Abadie, J.: Gastric Resection as the Method of Choice in the Surgical Treatment of Gastric Ulcer (De la résection gastrique comme méthode de choix dans le traitement chirurgical des ulcères de l'estomac). *Bull. Acad. de méd.*, Par., 1919, lxxxiii, 370.

Abadie reports a series of 30 gastric resections performed for gastric ulcer which did not include a gastro-enterostomy or a resection of the ulcer.

The 30 resections included 17 immediate pylorotomies involving from 6 to 12 cm.; 1 pylorotomy performed two months after a primary gastro-enterostomy; 2 pylorotomies done to supplement old gastro-enterostomies, and 10 extensive gastrectomies in 6 of which a side-to-side, and in 4 of which an end-to-side anastomosis was done. None of the operations was performed under general anaesthesia.

These 30 resections, varying from a limited pylorotomy to a gastrectomy involving three-fourths of the stomach, resulted in 28 recoveries and 2 deaths. Both deaths may be attributed to errors of technique.

The pathologic lesions were: ulcers of the lesser curvature, 8; ulcer of the anterior wall of the stomach, 1; double ulcer of the antrum, 1; mediogastric and pyloric stenosis caused by an old cicatrized ulcer, 1; hypertrophy of the pylorus, 1; and ulcers of the pyloric region, especially in the duodenum, 18.

If a patient in the forties gives a history of hypersthenic crises of increasing severity separated by gradually decreasing intervals of apparent recovery and the condition does not yield to medical treatment, operation is indicated. The history is the most important factor in the diagnosis; roentgenoscopy and examination of the stomach contents are merely confirmatory.

The author prefers gastrectomy to gastro-enterostomy as gastro-enterostomies often do not result in complete recovery and are frequently followed by recurrences, cancerous changes, etc. The only factor which favors gastro-enterostomy is its simplicity and this is relative.

W. A. BRENNAN.

Strauss, A. A.: Congenital Pyloric Stenosis. *Surg. Clin. Chicago*, 1920, iv, 93.

In congenital pyloric stenosis slight vomiting occurs when the child is between 10 and 14 days

old and gradually increases in severity until it becomes projectile in character. Peristaltic waves pass from the left hypochondriac region obliquely downward to the right side. These waves are more noticeable if the stomach contains food. As a rule a tumor can be felt in the right hypochondriac region if the child is emaciated, but this factor is variable. The degree of emaciation depends upon the size of the tumor or the degree of obstruction.

In the examination the child should be placed flat on its back and allowed to take some sugar water through a nipple. The typical peristaltic waves will then be seen. If more water is taken the stomach balloons out and becomes tonically contracted, tremendous retroperistaltic waves are noted, and projectile vomiting occurs.

The chief aid in the diagnosis is the fluoroscopic picture. For this examination a small amount of bismuth is added to the mother's milk and the child is placed under the horizontal fluoroscope. The milk then collects as a round mass to the left of the vertebrae. If the child is rotated to the right side, almost on its abdomen, the bismuth gradually gravitates toward the pyloric end of the stomach and peristaltic waves become visible at once. A small amount of bismuth squirts through and the pylorus clamps down tightly. Immediately thereafter peculiar and characteristic rhythmic, snake-like contractions of the pylorus can be seen which are independent of the rest of the stomach. According to the author these are absolutely pathognomonic.

If 80 per cent of the milk and bismuth remains in the stomach for four hours the retention is due to pyloric stenosis requiring surgical treatment. When 80 per cent has passed through in four hours, medical treatment will usually effect a cure.

In regard to the etiology the author states that it is not certain whether the muscular hypertrophy begins before birth or not, although a pyloric tumor in a seven months' foetus has been reported and several have been found in the new-born. In Strauss' opinion the condition begins in foetal life and is brought about by rhythmic contractions of the pylorus caused by abnormal stimulation from intrinsic or extrinsic nerves of the stomach. As a result of the constant motion these contractions produce hypertrophy which becomes accentuated after birth because of the additional irritation produced by the ingestion of food. The tumor then gradually becomes larger.

The author's operative technique is as follows:

A right rectus incision 1 in. in length is made, beginning in the right hypochondrium, and the tumor is brought up to the surface by means of a hook introduced alongside the finger. An incision is then made over the bloodless portion of the tumor on the upper outer quadrant, beginning well up on the normal side of the stomach and extending almost to the duodenal end of the tumor. The cut is made only through the superficial layers of the pylorus. The rest of the tumor is split with the handle of the

scalpel on the gastric end of the tumor where it converges into the normal stomach musculature. A line of cleavage is readily found and the split goes down to the duodenal end without causing a puncture of the mucosa (in the Rammstedt operation the mucosa is easily punctured and this explains the high mortality). The split tumor is grasped with the fingers and spread apart, the mucosa being thus separated from the musculature. The mucosa is shelled out with a blunt Kocher dissector. The inner portion of the hypertrophied muscle tumor is then split and used as a flap. The flap is turned out and sutured over the shelled-out mucosa with three interrupted sutures. The free end of the attached omentum is sutured over the area operated upon to cover the raw surface.

Failure in this operation is due to puncturing of the mucosa or incomplete splitting of the tumor. The mortality rate when the operation is performed by the author is 3 per cent while that of the Rammstedt operation varies from 15 to 30 per cent.

Following the operation 1 oz. of physiological salt solution is given by rectum every three hours. As soon as the child is awake it is fed alternately every two hours with mother's milk and water, 1 dr. of each being given at a time. The quantity is then gradually increased so that within from twenty-four to thirty-six hours $\frac{1}{2}$ oz. is allowed at a feeding.

In 30 per cent of the cases the tumor is more or less one-sided. Three-fourths of the hypertrophy is on the outer two-thirds of the pylorus. The inner third is small and concave. I. W. BACH.

Macleod, D. M.: Draining the Stomach When the Pylorus Is Not Obstructed. *Practitioner*, 1920, civ, 73.

When in cases of gastric ulcer the pyloric opening is normal and a posterior gastro-enterostomy has been decided upon, a very good method of draining the stomach is to make the incision in the jejunum about $1\frac{1}{2}$ in. longer than the incision in the stomach. Contractions which would otherwise close the opening in the stomach are then prevented from doing so by the greater bulk of the jejunum attached to the opening. An additional factor in maintaining the patency is the puckering of the jejunum produced by the method. The difference in the drainage afforded by this and the older method is well shown by the X-ray. P. M. CHASE.

Foisy, E.: Duodenal Occlusion Due to Congenital Malformation of the Ascending Mesocolon (Occlusion duodénale par malformation congénitale du mésocolon ascendant). *Bull. et mém. Soc. de chir. de Par.*, 1919, xlv, 1548.

Foisy's case of duodenal occlusion was that of a girl 14 years of age. Constant abdominal pain referred to the epigastric region was associated with periodic biliary vomiting. During the crises of vomiting it was necessary to resort to rectal feeding. There was rapid cachexia and increasing oliguria. The whole syndrome suggested duodenal occlusion.

The condition rapidly became worse and death finally seemed imminent.

On the fifth day after the diagnosis was made a median laparotomy was done. When the omentum and transverse colon were raised the duodenojejunal angle was seen to be situated to the right of the vertebral column. In the ascending colon above the hepatic angle was a kink due to a horizontal stricturing band of the ascending mesocolon. Section of this band caused the disappearance of the kink. The horizontal portion of the duodenum was compressed by a posterior band from the ascending mesocolon which was distinct from the anterior band. This band also was sectioned. The child recovered.

The stricturing bands were quite isolated and there were no other adhesions. It therefore appeared that they were congenital rather than inflammatory in origin. They were situated at the point where the attachment of the ascending mesocolon to the posterior parietal peritoneum ended.

There are two types of duodenal occlusion due to congenital stricturing bands: (1) high occlusion, above the ampulla of Vater, due to stricturing of the hepatic angle by a cysto-duodeno-omental ligament of congenital origin (Harris of Chicago has reported 6 such cases), and (2) low occlusion, below the ampulla of Vater, due to stricturing of the transverse portion of the duodenum by the mesocolon as in the case reported in this article. The latter type appears to be very much more rare than the former.

W. A. BRENNAN.

Perry, A. C.: Four Unusual Cases of Intestinal Obstruction. *Lancet*, 1920, cxcviii, 318.

The four cases reported were observed by the author within the space of forty-eight hours.

In the first case cited, that of an infant a few hours old, the proximal end of the distal ileum to the extent of 30 cm. was found to be only 1 cm. in circumference and the portion of bowel beyond the obstruction was practically empty. The atresic portion was twisted and bound by adhesions. A fact which rendered the diagnosis difficult was that on physical examination the patency of the rectum was questionable.

In the second case, that of a girl of 4 years, a segment of the lower ileum about 2 ft. long was found to be strangulated by two bands of adhesions between the walls of the ileum and the mesentery. For forty-eight hours this patient had had pain which was localized chiefly in the right iliac fossa and suggested appendicitis.

In the third case, that of a woman who was eighteen weeks pregnant, a hernia through the right sciatic notch was found with fixation of the gut. The cause of the obstruction was obscure, although the symptoms and physical findings in this, as in the other three cases, were those of obstruction. From the history it seemed probable that the hernia had occurred and reduced itself three days before it became strangulated. It is remarkable that this patient alone of the four survived, and that her

pregnancy continued in spite of the fact that the gut was ruptured at operation.

In the fourth case, that of a man 56 years of age, the cause of obstruction was a kink formed by a band of adhesions from the mesentery to the small intestine. A syndrome of mild type, the presence of a reducible inguinal hernia on the left side, and a tuberculous hip rendered the diagnosis difficult.

In addition to the case histories the article gives the details of the operations and the postmortem findings.

J. W. ROSS.

VandenBerg, H. J.: A Refined Technique in Intestinal Obstruction. *J. Michigan State M. Soc.*, 1920, xviii, 67.

In intestinal obstruction drainage of the distended gut has reduced the mortality practically 50 per cent and today is regarded as a fundamental principle in surgery. The author describes a modification of the technique used by Moynihan to prevent soiling as follows:

The gas is removed with a hypodermic needle, the gut stripped of its contents, a purse string suture introduced, and an opening made inside the suture just large enough to admit a glass tube $\frac{1}{2}$ in. in diameter. This suture is tied to the tube and the gut then pushed onto the tube as far as possible so that evacuation will be effected in all directions. Upon the withdrawal of the tube the suture is tied tightly, sterilized, and buried by a serous suture.

This procedure will absolutely prevent soiling.

P. M. CHASE.

Pitzman, M.: "No Surgical Appendicitis Without Organic Strictures." *Ann. Surg.*, 1902, lxxi, 149.

The author reports his observations of 250 cases of acute, and 500 cases of chronic, appendicitis and states his theory regarding the relation of organic stricture of the appendix to surgical appendicitis.

In acute appendicitis examination shows the appendix to be distally dilated and congested to within $\frac{1}{2}$ in. of the cæcum and beyond that comparatively normal in appearance. After the removal of the appendix a practically impassable stricture is seen at the juncture of the normal with the dilated portion and marked differences in the mucosa of the two parts demonstrate beyond a doubt that the stricture is the cause of the condition.

In gangrenous cases it will be found usually that the gangrene also stops short of the cæcum but extends into the mesentery for a variable distance depending upon the condition of the appendix. In the author's opinion the infection of the appendix is not hæmatogenous but due to the bacteria-laden fæces confined by the stricture to the distal end of the appendix.

The pathology of true chronic appendicitis is absolutely the same as that of the acute form except for the absence of infection, and appendicitis is the cause rather than the result of the adhesions so often found.

In cases of stricture there is a history of sharp pain, while in those without stricture pain is absent. The former are relieved by operation permanently and the latter only temporarily.

According to the author, the attack is brought on by closure of the stricture. Colicky pains follow, the appendiceal walls become involved, appendiceal peristalsis ceases, and localized tenderness on pressure results.

The author's conclusions are summarized as follows:

1. Attacks of acute suppurative appendicitis are brought on by closure of a preformed stricture.

2. The inflammation and eventual gangrene are caused by the bacteria in the locked-up fæces.

3. In true chronic appendicitis there is a stricture which during the intervals between attacks is patent.

P. M. CHASE.

Warwick, M.: Tuberculosis of the Appendix. *Ann. Surg.*, 1920, lxxi, 139.

This article reports three cases of proven tuberculosis of the appendix and gives a brief review of the literature. In one of the author's cases the tuberculous lesions were found only in the appendix.

Primary tuberculosis of the appendix is extremely rare. Secondary appendiceal tuberculosis is most frequently associated with a tuberculous process in the intestine, especially in the cæcum. The lesions in the appendix result from hæmatogenous infection and infection by contiguity.

Three forms of the disease may be recognized: (1) miliary, (2) hyperplastic, (3) ulcerative. The author describes each in detail. Frequently the diagnosis may be made only with the aid of the microscope. The symptoms resemble those of ulcerative appendicitis.

P. M. CHASE.

Bazy, Témoin, and others: Discussion Regarding the Operative Indications in Acute Appendicitis (Des indications opératoires dans l'appendicite aiguë). *Bull. Acad. de méd., Par.*, 1919, lxxxiii, 207.

In discussing the recent communication of Témoin on the treatment of acute appendicitis Bazy maintains that in this condition the surgeon is much more responsible than the physician. The surgeon should direct the treatment from the beginning. Immediate operation should be the rule. If the surgeon were called into consultation sufficiently early there would be no cause for delay.

During 1919 Témoin operated upon 234 cases of appendicitis, 177 in the febrile and 57 in the afebrile stage. Of the 177 operations in the febrile stage, 6 were performed within the first two days and in 2 of these cases pus was found in the peritoneum. All of the six patients recovered. The remaining 171 operations performed in the febrile stage were done between the third and the twenty-second day. In 90 cases the lesions were limited to the appendix. These patients recovered.

In 81 cases pus was found in the abdomen and in 42 of these the peritonitis was localized. One patient died. In the 39 cases of general peritonitis there were 11 deaths.

Témoin's recent statistics show a higher mortality than those reported previously. This he believes is due to the fact that the recent epidemic of influenza greatly increased the danger of appendicitis. Témoin is an advocate of surgery in every case but insists that the operation should be performed only when the condition is strictly appendicitis and not peritonitis. He operates in any stage and his total mortality has been 3.5 per cent.

Walther also states that the only resource against the grave hypertoxic forms of appendicitis and gangrenous rupturing of the appendix is immediate operation. Many such cases develop suddenly when the symptoms are very slight. In the absence of symptoms which render immediate operation obligatory, however, Walther does not operate in the acute stage as in such cases the operation must be limited and exploration of the colon is not permissible.

Walther's statistics for the past twenty years are based on more than 700 cases: 1899-1909, 365 cases, 17 deaths, mortality 3.85 per cent; 1909-1913, 153 cases, 8 deaths, mortality 5.50 per cent; and 1913-1919, 162 cases, 2 deaths, mortality 1.23 per cent.

These results are as good as those obtained by Témoin and those of the last five years are better. Walther insists, moreover, that operative recovery is not the only desideratum. The recovery following operation done in the afebrile stage is more thorough and attended by fewer undesirable post-operative sequelæ than that following operation performed in the febrile stage.

According to Jalaquier the discussion has brought out two principles: (1) that the procedure of the French surgeon is determined by the clinical examination and observations; and (2) that at the present time appendicitis is almost exclusively within the province of surgery. W. A. BRENNAN.

Whitelocke, R. H. A.: Appendicectomy by a New Route. *Brit. M. J.*, 1920, i, 211.

This report is based on a series of 843 cases covering a period of twelve years. There were 18 deaths, a mortality of 2.25 per cent. The author has used the method under discussion almost exclusively for the past eight years and claims results equal to those of operation by other routes. The advantages and disadvantages are outlined.

The operation is designed for the removal of the vermiform appendix through the right iliac fossa when general exploration is not necessary. The incision is made an inch or less internal or medial to and parallel with the anterior superior spine of the ilium with the spine as its center. It is $2\frac{1}{2}$ in. in length but may be longer. The aponeurosis of the external oblique is split in the direction of the incision and the internal oblique and transversalis

in a direction approximately at right angles. A white line found in about 58 per cent of the cases is a suitable cleavage line in the internal oblique. If this is not present the same direction is followed. The peritoneum may be incised directly or reflected mesially and approach made through the iliac fossa. The incision is made parallel with the skin incision.

The advantages claimed are many and would appear to overrule the drawbacks. From a surgical standpoint the accessibility in all subjects of the iliac spine as a landmark makes the incision more accurate. This accuracy is shown by the fact that in 86 per cent of cases the presenting viscus was the colon or cæcum and in only 2 cases in 800 was it impossible to find and remove the appendix. In one of these transposition was demonstrated by the X-ray and in the other a ptosed kidney had displaced the cæcum to the left side of the body.

Because of the accurate approach and the small amount of suturing necessary the operation is simpler and more speedily accomplished than others. It is also claimed for it that it is less apt to be followed by hernia, even after drainage. The tissues in the natural groove are comparatively free from strain and the muscles tend to draw together. The peritoneum is not so prone to approach the skin. It is thick and well supported by fat and the deep muscles are here separated through their thickest and strongest parts. Vessels and nerves may be avoided.

In addition it is possible by this procedure to ascertain the local condition within the abdomen before the peritoneal cavity is opened. Thus a retrocolic abscess may be opened from the iliac fossa and drained without disturbing adhesions already formed. The possibility of removing the appendix makes for a short period of drainage and a brief convalescence.

The disadvantages of the method are that exploration if desired must be done through a second incision, the cæcum is at times difficult to return, and gravity drainage is not obtained.

J. W. ROSS.

Waugh, G. E.: The Morbid Consequences of a Mobile Ascending Colon, with a Record of 180 Operations. *Brit. J. Surg.*, 1920, vii, 343.

The author begins his article with the statement that experimental, medical, and surgical research is still unable to explain the causes of all the disease conditions found in the right upper quadrant of the abdomen. A mechanical disturbance is often at work in addition to bacterial, toxic, and other factors. In a discussion of the anatomical relation of the ascending colon to the right kidney, duodenum, pancreas, pyloric end of the stomach, gall-bladder, and cystic duct, he mentions the importance of the normal rotation of the colon from the left iliac fossa to the right and the fusing of the mesentery of the ascending colon with the posterior abdominal wall. In a certain percentage of cases

(20 per cent of those examined at autopsy by Pirie) the original colonic mesentery persists and produces abnormalities of attachment varying from a complete primitive mesentery with non-rotation of the colon to the persistence of a very small part of the mesentery at one part of the ascending colon. In addition, a pseudo-mesentery may be formed by traction on the fascia of the posterior abdominal wall.

In its function the ascending colon is unique in that it must force a semi-solid mass uphill against gravity. In the presence of a persistent mesentery there is wasteful effort in the attempt of the colon to fix itself in order to make this function possible. As a result, traction is exerted on the attachment of the mesentery and this traction is transmitted to the viscera underlying its root. The consequence is a variety of clinical conditions which the author classifies as "gastric," "duodenal," "biliary," "renal," etc., according to the character and localization of the pain.

In the majority of the 180 cases reviewed the trouble began at about the twentieth year of the patient's age. Complaint was made of indigestion, fullness, flatulence, and lethargy after meals. The pain was of constant location and character but variable in time of onset, duration, and interval. The variation was to be explained probably by the variation in the load of the colon. As a rule there was loss of weight. Constipation preceded the onset in only 31 of the 180 cases. In the cæcum and ascending colon there was demonstrable fullness. Frequently the right kidney was palpable. Sixty-eight of the 180 patients had had an appendectomy.

The gastric type of the condition was characterized by pain simulating ulcer in location and character, but irregular in time of onset, duration, and free interval. Nausea was sometimes present but vomiting was rare.

The duodenal type was characterized by "hunger pain" three to four hours after meals. This was sometimes relieved by food but was also variable as to time of onset, duration, and free interval.

The biliary type of the condition was characterized by typical gall-stone colic with vomiting, collapse, rigidity of the right rectus muscle, and residual tenderness over the gall-bladder. In rare instances, a faint jaundice was observed. At operation a normal gall-bladder and a mobile ascending colon were found associated with a persistent anterior foetal mesentery joining the gall-bladder to the duodenum or hepatic flexure or a sagging of the gastrohepatic omentum which caused kinking of the cystic duct. The author believes that in such cases the incomplete occlusion of the cystic duct contributed to the formation of gall-stones.

The renal type of the condition was characterized by renal crises, collapse, vomiting, and a swollen and tender right kidney. The urine sometimes showed a few red blood corpuscles but a normal kidney was found on examination by cystoscopic ureteral catheterization or at operation.

Another type of case was that in which discomfort in the right inguinal fossa was associated with dyspepsia and a history of mucous colitis. When seen in children the condition was commonly called chronic appendicitis with discomfort in the right inguinal fossa, but no rigidity was noticed. Other characteristics of the condition were a full ascending colon, nausea, anorexia, a high fever, and acetonuria. Vomiting occurred rarely. In 100 children under 12 years of age who were operated upon a persistent mesentery was found in all and appendicitis in only 7. In 12 of 18 cases of bacilluria in children cures were effected by fixation of the colon.

The operative technique used by the author consists of the following steps: (1) a low right rectus incision sparing the nerves of the abdominal wall; (2) a general examination of the abdominal viscera; (3) freeing of the ascending colon on its outer side from the cæcum to the hepatic flexure, the mesentery being incised at its root; (4) freeing of the bed of the ascending colon from fat and cellular tissues until the psoas and quadratus lumborum muscles and nerves of the lumbar plexus are exposed; and (5) suturing of the colon back into its bed, beginning at the cæcum, the anterior longitudinal white band of the colon being attached to the curtain of the fascia and peritoneum by interrupted catgut sutures.

When in the gastric type of the condition there is a steep ascent of the transverse colon Waugh uses also Coffey's hammock operation.

After operation the patient is placed in Fowler's position and glucose is administered by rectum. Morphine is given if necessary. On the fourth day he is allowed to have a little porridge and from that time on the diet is gradually increased. Other factors in the after-treatment are the use of an abdominal belt and graduated exercises for two months.

The condition was of the gastric type in 97 of the 180 cases; of the duodenal type in 40; of the biliary type in 11; and of the renal type in 5. In 15 it involved the right iliac fossa. There were 4 gastric ulcers, 6 duodenal ulcers, and 1 case of colitis. The author does not include in this series 28 patients seen in military hospitals or the 100 cases in children under 12 years of age. After operation a large number of the patients were free from their previous symptoms and general improvement in nutrition, endurance, and weight was noted.

In cases of long standing in adults and those of very young persons with a brief history the results were poor. In the former the toxic effects described by Lane have been noted and in the author's opinion they are beyond surgical treatment.

Colic fixation is advocated as a less radical and more anatomical remedy for the condition than colectomy. Operation performed early in the course of the disease and on children offers the best results.

F. S. SCHOONOVER, JR.

LIVER, GALL-BLADDER, PANCREAS, AND SPLEEN

Candler, A. L.: Abscess of the Liver among British Eastern Troops. *Lancet*, 1920, cxcviii, 429.

Inflammation or abscess of the liver is a late complication of amœbic dysentery. Amœbic inflammation and abscess of the liver may occur, however, even when the patient has never had diarrhœa or symptoms which would lead to the belief that he is infected with the entamœba histolytica.

The amœbæ were found in only 3 of the author's 12 cases. Because they are not given treatment, patients without symptoms are more prone to liver involvement than those with symptoms.

The amœbæ are found in the walls of the ulcers which develop in the large bowel and may be carried to the liver by the portal circulation. There they cause either a general hepatitis or the formation of one or more abscesses. The abscesses are confined by a connective-tissue wall and around this is a zone of hyperæmia. The pus is usually greenish-yellow, slimy, and sterile. The amœbæ live in the walls of the abscess and are found in the drainage tube.

A solitary abscess usually develops in the right lobe of the liver and enlarges toward the ribs, beneath the diaphragm (through which it may perforate), or toward the epigastrium. In spreading toward the ribs or diaphragm it causes a local dry peritonitis or pleurisy, pain, reduction of diaphragmatic movements, and congestion of the base of the lung.

The diagnosis is difficult. The main symptoms are a temperature of 101 or 102 degrees, a pulse rate of from 100 to 110, asthænia, sallowness without jaundice, anæmia, localized tenderness depending on the location of the abscess, and a leucocytosis of from 4,700 to 28,000 with from 70 to 80 per cent polymorphonuclears and from 8 to 15 per cent of lymphocytes.

The X-ray is of great value in diagnosing the abscess which involves the diaphragm secondarily. The presence of pus, however, is the chief indication and this is usually discovered by making multiple punctures with the trocar and cannula with the patient under general anæsthesia. When the condition is believed to be an amœbic abscess and pus is not found by puncture, the liver should be explored through an abdominal incision.

The treatment of hepatitis consists of daily hypodermic administrations of emetine in 1 gr. doses for ten days, and a further course later if necessary.

If an abscess is present it must be drained either by the epigastric or the costo-diaphragmatic route. If drainage is to be effected through the thoracic wall $1\frac{1}{2}$ in. of rib must be resected. Before the posterior periosteum at the site of the rib is opened the diaphragmatic muscle should be stitched to the intercostal muscle to shut off the pleural cavity.

The author does not consider aspiration of the abscess and injection of quinine sulphate as efficient as drainage.

The after-treatment consists of hypodermic injection of emetine and careful asepsis in dressing to avoid secondary infection.

The differential diagnosis concerns mainly malaria and typhoid fever.

The prognosis depends upon the duration of the abscess, the amount of liver tissue destroyed, and the nature of the treatment.

J. A. H. MAGOUN, JR.

Smithies, F.: Clinical Manifestations in Gall-Bladder Disease; A Study of 1,000 Operatively Demonstrated Cases. *Northwest Med.*, 1920, xix, 31.

The operative mortality in the 1,000 cases reported was 5.9 per cent. Six hundred and seventy-two of the patients were females and 328 were males. The average age was 43.2 years. In 112 cases (11.2 per cent) acute infectious ailments seemed to be directly responsible for the initial evidences of the gall-bladder condition or excited to activity processes previously quiescent.

The conditions demonstrated at operation were as follows: non-malignant cholecystitis associated with calculi, 509 cases (50.9 per cent); cholecystitis with altered bile and sand-like substance, 46 cases (4.6 per cent); carcinoma of the gall-bladder, 19 cases (1.9 per cent); carcinoma of the gall-bladder associated with gall-stones, 14 cases (73.8 per cent of the total number of cases of carcinoma); cholecystitis without stones, "sand," or malignancy, 434 cases (43.4 per cent).

Appendectomy had been performed upon 84 patients prior to observation for the gall-bladder ailment. In 682 cases appendectomy was found to be indicated and was performed during the laparotomy for the gall-bladder condition. Accordingly, in 766 cases (76.6 per cent) the gall-bladder disease was associated with an abnormal condition of the appendix. Enlarged lymph glands were found in 124 cases, chronic pancreatitis with enlargement in 63, acute pancreatitis with fat necrosis in 2, enlargement of the liver in 73, and peptic (gastric and duodenal) ulcer in 80.

Pathologically the gall-bladder showed acute catarrhal inflammation in 228 cases (22.8 per cent). In 51 per cent of this group this inflammation was associated with stones and in 8 per cent by a sand-like substance. Chronic catarrhal inflammation was present in 328 cases (32.8 per cent) and in 63 per cent of this group was complicated by stones or "sand." Chronic inflammation was found in 434 cases of which 91 per cent showed stones or "sand." As has been stated previously, carcinoma was present in 19 cases.

In 21 cases re-operated upon within six months after gall-bladder drainage no stones were found at the second operation. It seems apparent, therefore, that the presence of gall-stones does not neces-

sarily indicate years of gall-bladder disease. About 85 per cent of gall-stones contain viable bacteria whereas the bile is actively infected in only from 20 to 30 per cent of cases.

In 59 cases of gall-stones there were apparently no symptoms of gall-bladder disease but close analysis after the presence of the stones had been proved usually disclosed mild digestive disturbances or even marked symptoms that had been overlooked. Less than 8 per cent of the patients were obese. In a little more than half of the cases the body weight had remained constant. Belching was a prominent and distressing symptom in 68.9 per cent of the cases, nausea in 37.6 per cent, and anorexia in 27.3 per cent. In 92 per cent the symptoms were those of dyspepsia.

Jaundice was present in 161 cases (31.6 per cent) in which gall-stones were demonstrated and was intermittent or constant in nearly one-fourth of the cases in which operation failed to demonstrate the presence of stones. This indicates how difficult it is to determine the actual condition and content of the gall-bladder before operation. Usually only a diagnosis of cholecystitis can be made even though certain symptoms point toward the presence of stones as well.

Pain was a characteristic symptom in 95.5 per cent of the cases. In 68.8 per cent it was intermittent, and in 21.1 per cent, constant. Apparently it was as severe in some of the cases in which there were no gall-stones as in those in which the presence of stones was demonstrated. In the latter group it usually ceased almost as abruptly as it developed. In severe colics the administration of opium was necessary.

In 90 per cent of the cases observed the pain was relieved by heat; in 45 per cent, by vomiting; in 82 per cent, by belching; in 22 per cent, by alkalis; and in less than 7 per cent by the ingestion of food. The relief afforded by food is an important point in the differential diagnosis between peptic ulcer and gall-bladder disease. In the latter the pain is commonly irregular and without apparent definite cause. Other frequent symptoms are a sensation of fullness on pressure, soreness, and a dull ache. In 74 per cent of the cases the right upper quadrant was the seat of the pain, and in 14 per cent, the entire epigastrium.

Transmission was absent in 32 per cent, including 23 per cent of the cases of gall-stones and 41 per cent of those of non-calculous cholecystitis. Transmission into the right back occurred in 63 per cent. Abdominal tenderness was recorded in 883 cases and absent in 117 cases. Jaundice occurred in 287 cases (including 25.5 per cent of those of cholecystitis without stones). Vomiting was annoying in 452 cases. Test meals showed an average content of free hydrochloric acid of 32.6 and a total acidity of 47.9. Gastric achylia was observed in 20.9 per cent of the cases. In 87 cases of cholelithiasis stones were definitely or inferentially demonstrated by roentgenograms in 19 (21 per cent).

W. H. NADLER.

MISCELLANEOUS

Williams, G.: *Loss of the Abdominal Reflexes in Affections of the Abdomen.* *Brit. J. Surg.*, 1920, vii, 320.

The author regards the loss of reflexes in patients with abdominal affections as a phenomenon of fatigue. The overlying rigidity and paræsthesia fatigue the muscles to a point at which the reflexes become lost. The process producing the change is not necessarily inflammatory or dependent upon a peritoneal covering since the reflex is found occasionally in patients with renal colic.

The period of loss of reflexes, which generally lasts for about twenty-four hours, is not completely coincident with the fixation of the muscular wall, but usually follows the rigidity.

The loss of the reflex may be due to an attempt to inhibit a reflex contraction of the abdominal wall over the painful or diseased part. Loss of reflexes in certain abdominal quadrants may be of value in localizing the involved area.

The author suggests that the fatigue of the reflex is cerebral rather than spinal. A. J. SCHOLL, JR.

Halsted, W. S.: *Self-Eventration of a Large Abdominal Hygroma through a Scalpel Prick of the Peritoneum.* *Bull. Johns Hopkins Hosp.*, 1920, xxxi, 13.

In May, 1893, a child 2 years old was brought to the operating room of the Johns Hopkins Hospital to be tapped for ascites. As the short incision was being made in the midline, the peritoneum was accidentally pricked. Immediately there protruded through the prick-hole a vesicle scarcely larger than a mustard seed. This little bladder slowly increased in size, soon covered the abdomen, and finally, in saddlebag fashion, fell over the child's flanks. A broad, flat isthmus of sac extended across the now scaphoid belly from one great bag of water to the other. The wall of the great cyst was of filmy thinness.

The midline incision was lengthened and a search made for the pedicle. Grouped about the pedicle were several small cysts all of which seemed to have their origin in the great omentum; embryologically, in the posterior mesogastrium. A separate cyst, about as large as an orange, seemed to be contained between the layers of the duodenal mesentery, the continuation of the stomach mesentery or posterior mesogastrium. This cyst was so adherent to the mesenteric vessels that it was feared its removal would imperil the circulation of the bowel. Therefore its wall was stitched to the parietal peritoneum and in a few days it was opened and drained. The child made a prompt recovery.

In 1915, twenty-two years later, the patient was examined again. According to her mother she had suffered no ill effects from the operation. She was then married and in good health. Examination of the abdomen revealed nothing abnormal except a little tenderness near the appendix.

Halsted states that the possibility of lymphatic cyst should be borne in mind whenever a child with distended abdomen comes under observation.

Another case cited in this article was that of an infant, 7 weeks old, who was operated upon at the Johns Hopkins Hospital for the relief of what was

supposed to be intestinal obstruction. The cause of the distention was a lymphatic cyst. The child died. In the author's opinion it is possible that this infant might have been saved if the correct diagnosis had been made and the cyst evacuated or possibly everted through a small incision. G. E. BEILBY.

SURGERY OF THE EXTREMITIES

DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Goodman, R.: *The Pathology and Treatment of Chronic Osteomyelitis in Unhealed War Wounds.* *Therap. Gaz.*, 1920, xlv, 94.

In the author's opinion the infection of war wounds is more lasting than that of wounds received in civil life and therefore requires longer after-treatment.

Traumatic osteomyelitis resembles the spontaneous osteomyelitis of childhood. While in civil life acute diffuse osteomyelitis rarely follows compound fractures treated by careful surgery, in war wounds complications are frequent because of the extent and severity of the bone lesion, infection, and the hasty first-aid treatment.

Goodman advises against the use of gauze drains in osteomyelitis and does not believe that heliotherapy is of any therapeutic value in such cases. The only treatment is operation at the proper time. The cavity must be obliterated by wide removal of bone to allow the neighboring tissues to fall in. The removal of a joint should be avoided if possible as an ankylosed joint is better than a flail joint.

E. C. ROBITSHEK.

Gibney, V. P.: *The Arthritides and Focal Infection.* *J. Orthop. Surg.*, 1920, ii, 63.

The term "arthritides" the author applies to an arthritis involving the articular or peri-articular structures of one or more joints. Osteomyelitic or periosteal lesions regarded as tuberculous or malignant are not considered.

Some years ago Murphy stated that the time was not far distant when the terms "rheumatism" and "gout" would be employed no longer, but laboratory workers and internists still maintain that these conditions are distinct entities and that they may be promptly relieved, if not cured, by specific medication. When the acute stage merges into the chronic stage, however, and when one or more joints are greatly impaired in function and persistently painful, search is now made for a focus of infection even though the laboratory continues to report the condition as rheumatism. Usually such a focus of infection is found in the oral cavity, the sinuses, the intestinal tract (including the gall-bladder), the genito-urinary organs, or the parts of the anatomy studied by the proctologist, the gynecologist, and the neurologist.

Gibney gives a brief history of several cases which have come under his observation. In his opinion arthritides are the most difficult cases in orthopedic surgery and while they naturally come under the care of the orthopedic surgeon it is better to rely for their treatment on a medical group as no one man can bring all of them to a successful issue.

Gibney's conclusions are summarized as follows:

A focus of infection should be diligently sought for in every case of arthritis in which tuberculosis, malignancy, or trauma are not self-evident causes or controlling factors.

A mono-articular arthritis demands the same painstaking investigation as a polyarticular arthritis for it is not possible to tell when the former may merge into the latter.

So long as the treatment of a focus of infection does not give relief, it cannot be assumed that the infection is at an end.

The arrest of the infection does not mean that the exudates in and around a joint will disappear unless orthopedic measures are employed to bring about resolution and restoration of function.

There may be more than one focus of infection. As many organs are exposed to bacteria of a pus-producing nature a careful study of these organs should be the rule.

G. E. BEILBY.

Jones, R.: *Flail Joints and Their Treatment.* *Brit. M. J.*, 1920, i, 175.

To prevent flail joints resulting from operations do not remove too much bone. Preserve the muscular attachments and important bone prominences. Do not keep the leg in traction too long after the excision. Maintain the joint in the position for best function, regardless of ankylosis or mobility in the end-results.

The treatment of flail joints is outlined as follows:

1. Treat radically all discharging sinuses and osteomyelitis. Fix the joint with its surfaces approximated as there is a chance of ankylosis, especially in the elbow and shoulder.

2. In the absence of sepsis fix the joint in the best position for function. Then re-educate the important muscles of the joint (in the shoulder, the deltoid; in the elbow, the biceps).

3. Approximate the joint surfaces and hold with sutures.

4. Attempt to ankylose the joint.

Flail hip: The treatment depends upon the amount of bone lost. If the head and neck are

missing, obtain function by the use of calipers and the correction of deformities. Bone grafting to obtain ankylosis is not expedient. If the trochanter and upper shaft are missing, a sliding graft reaching to the acetabulum will produce ankylosis. Grafts from other parts of the body are not satisfactory.

Flail knee: In this condition it is best to produce ankylosis by sawing off the bone ends. If there is much separation of the bones, use a sliding graft either from the tibia or femur. An alternative is the use of an artificial limb or calipers.

Flail ankle: Flail ankle is rare in war surgery. Treat by inducing ankylosis or by amputation.

Flail shoulder: Muscle re-education is preferred to ankylosis of the joint when only the head of the bone is missing and the muscles attached to the tuberosities and the deltoid are functioning. When more bone is missing an autogenous bone graft shaped like a mallet may be introduced into the humerus and the bulbous end fitted into the glenoid cavity. When there is much shortening of the humerus care should be taken to fix the joint in a position such that the patient is able to bring his hand to his mouth. The acromion and coracoid processes should be split and approximated to the humeral head and immobilization continued for three months. The scapula must be freely movable. Re-educate scapular movements.

Flail elbow: Conservative treatment is possible only when the ends of the bones are broad and the muscles can be re-educated. The operative treatment may be to induce ankylosis or to obtain a movable joint. Ankylosis is successful only when there is sufficient bone surface. Pseudarthrosis should be attempted only when the muscle power is good. Operation consists of making a wedge at the lower end of the humerus, placing fascia lata over it and then fitting it into a prepared space between the radius and ulna. The bones should be held together with a kangaroo tendon passed through a drilled hole. Fix the arm in abduction. Voluntary movement may be allowed after three weeks. Remove the fixation after eight weeks and place the arm in a sling to prevent stretching of the biceps.

Flail wrist: This condition is very rare and requires ankylosis.

Stiff joints: Stiff joints may be caused from fracture in the joint or long immobilization. Gradual flexion of a stiff knee instead of forcible flexion is preferred. The power of voluntary extension from the new angle of flexion should be tested regularly. If the quadriceps is adherent, loosen adhesions and interpose fat and fascia between it and the bone. When the capsule is scarred and shortened make a curved incision from the attachment of the internal lateral ligaments to the tibial tubercle. In cases of intra-articular adhesions, treat conservatively by gradual flexion. Effusion in the joint does not contra-indicate treatment. If the patella is adherent to bone by bony adhesions, chisel out and interpose membrane. If the adhesions are fibrous, conservative treatment may be attempted. Complete ankylosis

of the knee joint should be left alone in war surgery unless there is deformity.

Flexion of knee: If the knee is flexed at 30 degrees, leave alone; if flexed beyond that angle, do a cuneiform osteotomy and fix at an angle of 15 or 20 degrees. Lateral deviation of the knee and genu recurvatum should also be treated by osteotomy.

PIO BLANCO.

Giessler, P. W.: Foot Disabilities. *J-Lancet*, 1920, xl, 65.

Before his discussion of the pathology of the foot the author gives a detailed description of the anatomy, movements, and functions of the normal foot.

Weak foot is due to derangement of the foot mechanism from the fatigue and strain of muscles working at a disadvantage. Ill-fitting shoes and faulty attitudes, diseases such as tuberculosis, arthritis, and prolonged illness, injuries such as sprains and Pott's fracture, adiposity, inactivity, and overwork are some of the important etiological factors.

The symptoms vary, the most common being weakness of the ankles, fatigue, discomfort in all shoes, stiffness and swelling, numbness, and moisture, especially in the afternoon and evening. The patient does not walk as much as usual. The pain or discomfort may be in any one area or in several—the heel, arch, ball of the foot, instep, outer border, calf, knee, thigh, hip, or back. Usually the discomfort is present only during or just after the foot is used.

These early symptoms are due to muscular strain which may precede depression of the arch by some time. Inward bulging and abduction of the forefoot may be the only deformities. When the ligaments give way, the bones assume abnormal relations and the feet become flat. After the bones become fixed in an abnormal position pain is often absent. All flat feet are mechanically weak, but not all are painful. In some cases low arches are inherited.

Before the shoes are removed the author notes whether the patient limps or toes out; whether the gait is elastic, the inner ankles are prominent, the soles are flat on ground, the toes are turned up, or the joint of the big toe is prominent.

In the bare feet he notes whether the toes are flat, flexed, or extended, parallel or pinched; whether there is a bunion; whether the forefoot is flat and wide; the scaphoid bulges; the tendo achillis is vertical or convex; and whether there are callouses. He determines also the circulatory condition of the feet and notes whether Feiss' line is below the scaphoid, whether the patient can rise easily on the toes, and whether the height of the arch is increased in that position. A plumb line from the center of the patella falls inside the second toe. Further examination is made for foot deformity at rest or with weight bearing. The range of motion and the power of abduction and adduction are tested. An impression of the foot is made with and without weight

bearing. The X-ray is used to determine the presence of changes in the bones, exostoses, and arthritis.

The author gives Whitman's classification of foot disabilities: (1) the normal foot improperly used; (2) the foot which is normal at rest, but forced into an attitude of deformity by weight; (3) the foot in which voluntary motion is limited and forced motion is painful; (4) persistent deformity with the foot at rest.

The object of treatment is to bring back to normal the shape, attitude, and voluntary motion of the foot.

The shoe should be broad enough in the toes to permit plantar flexion of the toes. The sole should be the shape of the sole of the foot, the heel broad and the inner edge straight. If the muscle balance is correct, a flexible shank may be worn.

Dancing, proper walking, and exercises are beneficial. In some cases manipulation should precede exercises. In the treatment of more rigid feet forcible manipulation and over-correction in a plaster cast may be necessary.

A lift the entire length of the inner border of the shoe may be sufficient with or without strapping.

A brace must always be used after forced correction of rigid feet and must be made over a plaster model. Heat followed by massage is beneficial during the period of muscle strengthening. In some cases tenotomy or stretching of the tendo achillis is necessary.

Lowering of the anterior arch is usually due to narrow pointed shoes. To correct this condition a felt pad should be fastened with adhesive strips just behind the metatarsal heads. Later, if necessary, a brace with an anterior arch convexity may be used. Flexion exercises of the toes strengthen the natural supports.

D. H. LEVINthal.

FRACTURES AND DISLOCATIONS

Albee, F. H., and Weigel, E. P.: Restoration of Loss of Bone, Including an Analysis of the First Hundred Cases of Fracture Treated by Bone Graft at the U. S. General Hospital No. 3, Colonia, N. J. *J. Am. M. Ass.*, 1920, lxxiv, 589.

The successful treatment of traumatic fractures depends primarily upon the recognition of the underlying laws of tissue growth and healthy metabolism. In the surgical repair of bone by means of the bone graft the technique and mechanics of the work are based wholly on the establishment of a suitable environment for the growth of the transplanted bone and the ultimate solid fixation of the fragments which have been grafted together. Conditions favoring the operation of Wolff's law of bone growth and the important influence exerted upon bone proliferation by mechanical stress (the frictional-irritation law of Roux) are provided by the inlay or Albee method of technique. By this procedure the graft, which is accurately cut and includes all four bone layers, is inserted with a cabinet maker's accuracy

of fit and with exact coaptation of the corresponding layers of the graft and host fragments, i.e., the periosteum, cortex, endosteum, and marrow.

All metal agents for internal fixation are absolutely contra-indicated in this work. The graft itself must serve as the main fixation agent as the use of foreign bodies, such as screws, metal plates, and nails, inhibits the growth of the transplanted tissues and introduces a devitalizing element which may be a potent factor in arousing latent infection.

In the cases reviewed in this article—the first 100 cases of fracture treated by Albee with bone grafts at U. S. Army General Hospital No. 3 at Colonia, N. J.—difficult problems of mechanical adjustment were often encountered. The procedures included operations performed for the replacement of bone loss and the restoration of motion and function in the shoulder joint, the synthetic transplantation of tissues in the formation of new fingers when all but the thumb had been shot away, the relief of compression fractures of the spine, and the repair of the mandible.

It is believed that success in this type of osteoplastic work depends in large measure upon the careful observance of such points of technique as the following: an early and thorough study of the wound; pre-operative treatment of persistent infection; the use of the inlay type of graft including all four bone layers which is so inserted into the host fragments that its layers are in perfect apposition to the corresponding layers of the host bone and it fits in place exactly; adequacy of the graft to serve as the main fixation agent; accuracy and rapidity of operative technique (greatly facilitated by the use of electrically driven instruments); and adequate postoperative fixation by immobilization in a plaster of Paris cast.

Willard, D. P.: The Treatment of Non-Union in Compound Fractures. *Ann. Surg.*, 1920, lxxi, 182.

The author had an opportunity to see a great many ununited fractures treated according to a variety of methods while working with the British at Shepherd's Bush and St. Katherine's Hospital in London. He is fully convinced that the percentage of non-union was much smaller in the casualties of the 1918 campaign than in the campaigns of 1915 and 1916. This was due unquestionably to the better surgical technique used at the casualty clearing stations and especially the employment of Thomas splints.

The cases of true non-union were due to infection or extensive loss of bone substance caused either by a missile or too radical removal of bone fragments at the primary operation.

The treatment may be divided into two main parts: first, the restoration of function of the disabled limb, and second, the treatment of the fracture. If in a fracture of the arm the use of the fingers is delayed until the fracture is healed, great difficulty will be experienced in obtaining functional

efficiency. Much of this disability can be avoided by early exercise, active whenever possible and passive only when the fracture is so low that active motion is prohibited.

The length of time that should elapse between the closing of all sinuses and the operation for non-union should be at least six months, and if the infection has been severe and prolonged, nine or even twelve months. Heavy massage of the scar for ten days should be carried out before any operation is done. If a reaction appears operation should be delayed.

At the first operation the scar should be dissected away from the soft parts and from between the bone fragments. Smears from the deep tissues should be made and the wound closed. In some cases infection will reappear after this operation, but if no reaction occurs the secondary operation should be done in eight or ten days.

The author is opposed to the use of any metal as a fixative as it acts as an irritant and causes bone atrophy at the place where growth is most desired. When it is possible to freshen the ends of the bones and obtain good apposition by the aid of catgut or kangaroo tendon, this should be done. Autogenous grafts taken either from the same bone or, better, from a healthy bone in some other part of the body afford the best fixation. In the smaller long bones a thin, flexible graft covered with periosteum seems to give better results than heavier grafts which may be entirely absorbed within a short time.

It must be borne in mind that many cases of so-called non-union will eventually unite if good immobilization is continued for a long time.

GATEWOOD.

Henderson, M. S.: Ununited Fractures of the Hip.
Surg., Gynec. & Obst., 1920, xxx, 145.

This paper is based upon the study of 120 cases of ununited fractures of the neck of the femur. Sixty-eight of the patients were males, and 52, females. Twenty-six were operated upon, but in 94 cases no attempt was made to relieve the condition. In the majority of cases non-union resulted from incorrect diagnosis at the time of the accident, but often, for some justifiable reason, no treatment had been given even when the diagnosis had been correct. In a few cases the measures used had been rather routine and not adequate in any sense.

Of the patients operated upon, 20 were males, and 6 females. The duration of the non-union varied from three months to three years. Nails or screws were used in 8 cases, and bone in 18. There were no deaths. Infection, which was slight, developed in only 2 cases. In 8 cases in which metal was used as a fixative, a good result was obtained in only 1. Autogenous grafts may be obtained from various bones but the fibula is the most satisfactory.

The end-results of the operation in 7 of the 26 cases are not known. Ten operations were successful and 8 are known to be failures. One patient is still under observation, but the result in this instance promises to be good. Thus good results, i.e., bony

union and good function, were obtained in 38 per cent of the operations. Of the entire series of 120 patients coming for relief, however, only 10 (8.3 per cent) were benefited.

The author summarizes his conclusions as follows:

1. In the majority of cases non-union is due to the fact that the fracture was not recognized at the time of the accident and therefore was not treated. In other cases, in which the diagnosis is made correctly, the treatment is often faulty and weak. An impacted fracture must be kept impacted until it is united.

2. Comparatively few of the cases of ununited fractures of the hip are suitable for surgery.

3. Advanced age, poor general health, etc. are contra-indications to operation, but the chief contra-indication is absorption of the femoral neck. In the case of a patient 25 years of age the absorption of the neck of the femur may be so great five months after the accident that no measure will offer any hope of benefit.

4. In suitable cases any means that will freshen the fractured surfaces and maintain them in apposition is sufficient. For the latter purpose autogenous bone pegs are the most satisfactory.

5. Bone from the fibula seems to be best for bone pegs as it is easily obtained and is never missed if it is removed 4 in. above the external malleolus.

Turner, P.: Notes on a Series of 103 Cases of Compound (Gunshot) Fractures of the Femur Treated at a General Hospital in France.
Lancet, 1920, cxcviii, 488.

The author recognizes three periods in the evolution of the treatment of fractures of the femur. In the first, which occupied about the first year of the war, the methods were very similar to former methods. In the second period, which extended from the summer of 1915 to about the beginning of 1918, new methods of treating wounds and fractures were brought forth and perfected. The improved methods which brought about the good results obtained during 1918 included the use of the Thomas splint, the suspension method of Sinclair, the caliper method of extension, and the use of other contrivances for improving position. The appliances were really devised during the second period. The third period began early in 1918 and was characterized by the establishment of a specially equipped femur hospital for each area in France and similar hospitals at home.

The series of 103 cases considered by the author were treated during the second period in General Hospital No. 3. Before admission the treatment consisted in cleansing of the wound and usually the application of a Thomas splint.

X-ray examination was followed by the removal of all loose fragments and foreign bodies and the application of a Thomas splint or, in a few cases, a suspension Hodgen. The patients were not discharged

until active sepsis had subsided and all danger of secondary hæmorrhage had passed. The average stay in the hospital was fifty-two days. The mortality of this series was 13.59 per cent. The author gives the cause of each death.

Comparison of the mortality statistics of this series with those of the earlier period shows a great improvement in the second period. The mortality in 5 cases of amputation in this series was 20 per cent.

The author describes a new method of measuring the degree of shortening in femurs fractured below the neck. He measures from the great trochanter to the head of the fibula.

W. P. HERBST.

Bowlby, A.: The Results of Fracture of the Femur Caused by Gunshot Wounds. *N. York M. J.*, 1920, cxi, 133.

The author reviewed the histories of cases of fracture of the femur and found that there was a general improvement in the results of treatment throughout the war.

The number of limbs saved increased greatly toward the end of the war. The conditions necessitating amputation were acute sepsis in 40 per cent of the cases, gas gangrene in 33 per cent, secondary hæmorrhage in 12 per cent, dry gangrene in 4 per cent, and osteomyelitis and other conditions in 11 per cent.

Shortening, malposition, joint stiffness, and non-union became rare with the adoption of improved methods of management.

The Thomas splint applied at the front was used during transportation. At the base hospital its use was continued or a Hodgen or a Watkins-Williams splint was applied to permit joint mobilization. With the improvement in the methods of splinting open operations became less frequent. All procedures were carefully controlled by the X-ray.

The removal of necrosed bone was not long delayed. This operation was necessary in from 20 to 30 per cent of the cases and was performed between the eighth and fourteenth weeks.

Primary and delayed primary closure of the wounds gave increasingly good results. K. L. VEHE.

Mosti, R.: Fractures of the Anterior Tubercle of the Tibia (Frattura da strappamento della tuberosita anteriore della tibia). *Riforma med.*, 1919, xxxv, 693.

Direct fracture of the tibial tubercle may be either partial or total. A total bursting fracture is always complicated by injury to the ligaments. In total rupturing fractures the tubercle is completely detached, the detached fragment consisting of the tubercle alone, a part of the tibial head, or the articular cartilages. The form and dimensions of the fragments therefore vary greatly.

The detached fragments may assume any one of three positions: (1) they may remain in their normal position, held by strips of periosteum or patellar

ligament; (2) they may undergo a movement of basculation, the base remaining fixed, and either protrude from under the teguments or become embedded between the femoral and tibial condyles; or (3) they may ascend so that the patella is raised to a plane higher than normal (the synovial membrane may or may not be involved).

Many types of partial fractures of the anterior tibial tubercle may be recognized only by roentgenological examination. Osgood-Schlatter disease is classified by some authors as a partial fracture of the anterior tubercle of the tibia, but by the majority is believed to be of inflammatory origin.

The symptoms of fractures of the tibial tubercle vary according to whether the fractures are partial or total, but both types of injury are manifested by local pain, functional impotence, and loss of the power of extension. The author sums up the differences between them as follows:

Total fractures: The swelling in the region of the knee is considerable and diffused even over parts of the upper third of the leg. The skin is usually unbroken. The patella protrudes and its mobility is greater than normal. Beneath the patella a bony mass can be felt which is movable in every direction. Under the bone fragment is a depression which corresponds to the head of the tibia and was formerly occupied by the tubercle.

Partial fractures: The swelling is less pronounced and more localized than that following total fracture. In nearly every case the skin is injured. The patella occupies its normal position and there is no bony mass beneath it. Only when the lower portion of the patellar tendon is injured is there irregularity in the form of the bony surface of the tibia with pain on pressure. Instead of a depression in the area occupied normally by the tubercle there is a projection of the partially detached fragments.

A clinical diagnosis of total fracture is possible when the local condition is favorable but when, as in the majority of cases, the swelling is marked, the diagnosis is very difficult. The condition may be confused with contusion and deformity of the knee, fracture of the upper extremity of the tibia, detachment of the lower insertion of the patellar ligament, and transverse fracture of the patella.

Partial fractures also may be difficult to diagnose and in many cases a clinical diagnosis may be made only by determining the location of the pain exactly. Radiography is the principal aid to clinical diagnosis, but is not to be relied upon too implicitly.

Partial fractures may be treated by massage and progressive mobilization. Total fractures demand operation; the tuberosity should be reduced to its normal position, blood effusions removed, and bone spicules which cannot be replaced in proper position should be extracted. Orthopedic treatment of total fractures usually gives poor functional results.

A case of total fracture in which operation was performed is reported.

W. A. BRENNAN.

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Tuffier: Cinematic Amputations (*Les amputations cinématiques*). *Bull. Acad. de méd., Par., 1920, lxxxiv, 51.*

In order to study the value of cinematic amputations at first hand Tuffier visited the Rizzoli Orthopedic Institute at Bologna and several Italian clinics. The procedure most frequently employed, and the only one which he believes is efficacious, is the formation of a unilateral or bilateral muscular or tendinous loop. Other types of cineplastic operations have only a limited application and their ultimate value is doubtful. In all of the latter the motor is powerful, but in the majority the movement is either useless or insufficient.

Cinematization after amputations of the leg or thigh has not been very successful but following an amputation of the arm, and especially of the forearm, the results of both primary and secondary cinematization are of interest.

Tuffier studied the muscle motor, the mobility of the cinematic loop, and the value of the mobile part of the prosthetic apparatus attached to the cinematized limb stump. While the first two, i.e., the surgical parts, give good results, those obtained from the prosthesis are defective. In fact, the general inferiority of cinematizations as regards practical results is due entirely to the imperfection of the cinematic apparatus. Proving this is the fact that in most cases not more than 5 or 10 per cent of the muscle motor is transmitted to the fingers of an artificial hand.

W. A. BRENNAN.

Mennell, J. B.: Some Remarks on "Bone Setting": The Practice and Results of Forced Movement. *Lancet, 1920 cxcviii, 297.*

Mennell states that until the old doctrine of absolute rest and fixation has been supplanted by the more modern Lucas-Championnière combination of rest and mobilization, the type of disability which fills the "bone-setter's" rooms will never disappear. Failure to correct disability resulting from injuries is due to the lack of proper knowledge of the normal function and movements of joints and the overzealousness of a large number of surgeons who are afraid of doing too little. Adaptive shortening of muscles resulting from non-use or the presence of sepsis is of importance and the correction of this disability should be such as gradually to restore the elasticity of the muscular connective tissue.

Adhesions of the tendons or joints should be broken up by a rapid steady movement in order that stretching of the pathologic structures or straining of the normal muscles and tendons may be avoided. With few exceptions general anæsthesia should be used during manipulation as this will abolish the strain sometimes inflicted upon muscles which normally act as antagonists to the proposed forced movement. In cases uncomplicated by sepsis forcible manipulations may be performed at the

end of five or six weeks, while in those complicated by sepsis much is gained by waiting five or six months.

In the manipulation of the joints it is important to determine what movement or movements are limited or give rise to pain. When an adhesion gives way manipulation should be stopped immediately.

Much depends upon the after-treatment following forcible movements. Voluntary movements and gentle massage should be employed early unless there is too much pain and in that case it is doubtful whether a great deal has been gained from the manipulation.

F. B. SETTLE.

Latarjet: The Influence of Muscle Resections upon the Growth of Bone (*De l'influence des résections musculaires sur l'accroissement des os*). *Lyon méd., 1919, cxxviii, 557.*

The author carried out his experiments on young cats and rabbits. He resected the triceps muscle of one foreleg of each animal and the pelvitrochanteric muscles in one hind leg. In one case there was some inflammation with secondary luxation of the limb. In the others the operative wound healed normally. The conclusions drawn were as follows:

1. Resection of one muscle or a group of muscles inserted on the same apophysis causes a decrease in the growth of the apophysis.

2. Muscle resection affects the development of all of the bones of the limb, particularly the epiphyses and articular surfaces. While the bone may increase slightly in length, it becomes thinner.

3. The results of the experiments verify clinical observations.

W. A. BRENNAN.

Leriche, R.: Anatomical and Functional Results of Aseptic Primary Resection of the Shoulder (*Résultats anatomiques et fonctionnels donnés par la résection de l'épaule en milieu aseptique pour traumatisme—résection primitive*). *Lyon chir., 1919, xvi, 439.*

Leriche gives the clinical histories of 9 primary resections of the shoulder done shortly after the injury was received and before infection had set in. In all of these cases the results were excellent. There was no great laxity of the arm even when the operation had been very extensive. In some instances the resection included a large part of the scapula, but there was not a single case of loose or wobbly shoulder. In 2 cases there is now almost complete mobility with solidity; in 6 cases, quite adequate mobility with solidity; and in 1 case, almost complete ankylosis.

Primary resection of the shoulder in these cases, therefore, gave results much superior to those which Leriche has observed following resections in infected areas.

The operation itself and the postoperative treatment must be directed especially toward assuring solidity of the shoulder and humeroglenoid fixity. Therefore disinsertion of the tuberosity and luxation of its head preparatory to sawing it are both to be

avoided. Leriche chips off the head with a chisel and mallet. By this method he substitutes for the Ollier subcapsular periosteal resection an intracapsular periosteal resection which, if necessary, is followed by subperiosteal clearance of bone fragments and spicules.

After the operation the thorax and the stump of the shoulder should be carefully immobilized in plaster for at least a month. During the drying of the plaster the humerus must be held well against the glenoid cavity.

W. A. BRENNAN.

Irwin, S. T.: End-Results in Partial Amputations of the Foot. *Brit. J. Surg.*, 1920, vii, 327.

The author's observations of partial amputations of the foot were made in the Limbless Department of the U. V. F. Hospital, Belfast. The paper is illustrated with photographs and roentgenograms of cases treated by various operations.

Amputation of the toes, and particularly the great toe, should be avoided if the condition can be relieved by other means.

Of all amputations of the lower limb, those of the foot are the most disappointing. At first the results seem good, but sooner or later a large percentage of the patients return because of pain and inability to do efficient work. The main objection to partial amputations performed on the foot is that the anterior pillar of the anteroposterior arch is shortened, and this shortening, with the force of the weight downward, the pull of the tendo achillis, and other obvious mechanical factors, produces a potential equinus. In amputations which preserve the insertions of the tibials and peronei, the deformity is not a true equinus as these muscles in part counteract the tendency to deformity and produce, with an equinus, a varus due to muscular contraction.

The author mentions the work of Tuffier, Depage, Broca, Treves, and others who have shown that the more the anterior limb of the anteroposterior arch is shortened, the greater the deformity and disability. In addition to the disablement due to this shortening another disadvantage arises from the fact that the scar, at first well anterior or supero-anterior, is later lowered until it becomes inferior.

After the Lisfranc amputation symptoms are not usually present until the patient has walked. He then complains of pain in the ankle joint. This is due to the dropping of the arch and spastic contraction of the tibial and peroneal muscles which result in spasmodic inversion. The weight of the body is borne on the outer border of the foot, the inner border being held up by the tibialis anticus. The cuboid is drawn inward under the ankle joint. X-ray examination shows the os calcis drawn up, the cuboid lying beneath the anterior part of the ankle joint, and in cases of long standing, a bunion over the cuboid.

Following Chopart's amputation, symptoms are complained of only when the foot is used in standing or walking. The anterior part of the os calcis and the head of the astragalus rotate downward, carry-

ing with them the scar which subsequently becomes the bearing surface. The weight is borne chiefly under the ankle joint and the heel is drawn up behind. These findings are substantiated by the roentgen examinations.

With a view to obtaining better function, modifications of Lisfranc's and Chopart's operations have been suggested. The greatest possible lengthening of the anterior pillar of the arch is especially desired. The author believes that the Chopart amputation is the operation of choice if the scaphoid is retained. The Lisfranc operation would be improved if an inch of the metatarsals were retained. In either case, the anterior pillar would be lengthened.

Division of the tendo achillis, suture of the extensor tendons to the plantar fascia, or ankylosis of the ankle joint would lessen the deformities and disabilities secondary to amputations of the foot, but these have all been tried without much success. It is the author's belief that Lisfranc's and Chopart's amputations were valuable when anesthetics and antiseptics were not employed and rapidity of operation was an important factor. Under present conditions they should not be performed.

When amputation is required at the ankle joint the Syme operation is the procedure of choice. The shortness of the limb will allow a pad over the heel of an artificial limb, the plantar skin gives a good bearing surface, and there is ample leverage for activating the limb. The Pirogoff operation is not advocated because good bony union often fails to take place, the skin on the bearing portion of the stump is not true plantar skin, and the stump is so long that elevation on the sound side is required for correct fittings.

B. R. PARKER.

Chutro, P.: The Treatment of Arthritis of the Instep Following War Wounds (*Traitement des arthrites du cou-de-pied consecutives aux blessures de guerre*). *J. de chir.*, 1919, xv, 364.

Chutro has seen a number of cases in which a more or less typical resection of the instep had been done. In many the functional result was poor, not because of the astragalectomy itself but because of the postoperative treatment. In a large number of these cases the use of orthopedic apparatus, a tarsal amputation with tenotomy of the tendo achillis, or an osteoplastic operation was necessary in addition to the astragalectomy.

In Chutro's opinion astragalectomy is an excellent operation if deformity is obviated. The technique he recommends is as follows:

An S-shaped incision is begun at the base of the external malleolus, near the posterior edge, carried down to the base of the bone, continued horizontally across the tarsal sinus as far as the edge of the extensor proprius of the great toe, and then brought down to the second cuneiform. The astragalectomy is then done with the foot placed in varus. The edge of the cuboid is fixed to the edge of the malleolus with a bronze wire. This prevents frontward displacement of the foot, varus, and equinus, maintains

the anterior extremity of the calcaneum at an angle of 15 or 20 degrees, and obviates ankylosis.

Following the operation bandaging of the foot is of the utmost importance. It should be done with several turns in a figure of 8 to maintain the foot at a right angle. If there is much bleeding a second bandage may be applied over the first one and renewed as often as necessary. The first bandage should not be changed until after fifteen or twenty days when the drains should also be removed. The wound will then be found to be granulating.

From the third week the patient should move the toes actively. At about the fifth week the metallic wire should be removed and from that time forward the bandages should be sufficiently loose to allow the patient to flex and extend the foot actively. From the time he first gets up he should not be allowed to use a crutch.

In the 19 cases which the author has treated in this manner a recovery was obtained in all. Ankylosis did not develop in any case. In a few there was considerable fibrous rigidity, but in the others active mobility between 20 and 40 degrees was preserved and the foot was not painful. In some cases a scar is adherent to the extensor tendons. Pes equinus was not observed. W. A. BRENNAN.

ORTHOPEDICS IN GENERAL

Corner, E. M.: The Phantom Limbs of Amputés. *Practitioner*, 1920, civ, 81.

In a study of more than 500 patients who had undergone an amputation the author found that the sensation of a phantom limb developed immediately after operation, more usually in the cases of older patients and in military rather than civil practice. As a rule it became less frequent and distinct as time went on.

Dreams are considered important in determining the origin of the sensations. Constant, unvarying local physical signs suggest a local lesion.

The character of the sensation is usually cramp-like or crushing. Sometimes it is scalding. Tarsus-crushing phantom, an adductor spur, and tenderness along the femoral artery are indications for operative treatment. In these cases removal of the femoral artery from Hunter's canal relieves the pain. Usually this vessel will be found bound down with scar tissue or with a silk ligature on it and the internal saphenous nerve adherent to it.

The phantom limb usually disappears in time, but when it persists the patient grows depressed and even homicidal. Sometimes the phantom disappears but returns when an unsuitable, badly-fitting artificial limb is applied. Changes of weather, cold, dampness, and absence of mental occupation affect the sensations.

That many of these phantoms are central in origin is shown by the following points: (1) operation frequently fails to cure the phantom; (2) frequently patients dream that they have lost the other limb; (3) very often the sensations are not distributed in the anatomical areas of a nerve or nerves; (4) removal of a limb is followed by degeneration to the cortex in the central nervous system; and (5) laminectomy and division of the spinal roots in one case failed to relieve the pain, the source of which was obviously higher.

Marinesco of Bucharest showed that when the nerve fibers regenerate, they branch, divide, join with other bundles, and re-inervate and invade structures like a malignant growth. Thus the sensations passing through them are complicated.

The treatment of the phantoms is very difficult and depends upon the character of the sensations, their variations, the temperament of the patient, and the duration of the phantom. Massage and exercises cure some cases and operative measures cure others. Other patients get well without special treatment. Frequently the application of a well-fitting limb and return to civil occupation overcome the condition. D. H. LEVINTHAL.

SURGERY OF THE SPINAL COLUMN AND CORD

Eastman, J. R.: The Operative Technique in Spina Bifida. *J. Am. M. Ass.*, 1920, lxxiv, 156.

The first step of the operation consists in taking every precaution against contamination of the wound. The importance of this cannot be over-estimated as the one imminent postoperative danger in spina bifida is meningitis from wound infection. The possibility of contamination is especially great because of the fact that the site of the wound often lies near the anal region and is also in the direct groove along which the urine and feces are most apt to extend. With this fact in mind, the author places a piece of rubber dam over the tumor and sutures its lower border with fine chromic catgut to the skin of the child's back. By re-inforcing this suture line with collodion, it may be made water tight. The

rubber dam is then turned downward and the second step of the operation is begun.

In the second step the circular collar of true skin usually present about the base of the tumor is divided. When the scissors-spreading method of dissection is used, this circular incision may be made with little danger of the escape of fluid. The neck of the sac is then exposed in the same way as the neck of the sac of an umbilical hernia in the Mayo operation, freed of all fat and connective tissue, and grasped between the rubber-covered jaws of a pair of light, delicate intestinal forceps.

After the neck of the sac is clamped the sac is opened by snipping it through the thinnest part, which is usually at the vertex of the tumor. By opening it with a very small incision enlarged by

scissors-spreading dissection, the cord and nerves may be saved from trauma. If when opened, the sac is found to be free from nerve elements, a stout ligature is applied under the clamp jaws, the sac is cut away, and the clamp is removed.

If the opened sac is found to contain cord or nerve tissue, these structures may be removed in some instances by blunt dissection while the light clamp is kept in place to prevent the escape of fluid and the entrance of infection. If necessary, the bony defect of the vertebral column may be enlarged to admit of their replacement. This removal of bone can be done while the clamp is still applied.

After the neck of the sac has been tied and the clamp removed, no attempt is made to close the bony defect by an osteoplastic operation. The danger of this step probably offsets its few and doubtful advantages. The muscles are drawn together over the stump of the sac and the skin wound is closed with a continuous suture of fine chromic catgut either transversely or longitudinally, depending upon which is more easily accomplished. Hæmostasis should be complete.

Procedures directed against wound contamination, which were begun by the stitching of the rubber dam to the child's back, are now completed. Collodion is applied over the wound line and over this a strip of gauze is placed, its edges being glued to the skin with adhesive plaster straps. This gauze and adhesive plaster are then painted with the collodion solution, after which the rubber dam protector is drawn up and laid flat upon the back, and its three remaining margins are glued to the skin by adhesive plaster straps. Next, a small triangular piece of adhesive plaster is so applied that a sharp point passes downward between the buttocks with the base of its triangle overlying the straps of adhesive plaster securing the lower border of the rubber dam. The adhesive plaster is then covered with collodion so that the zone of operation is sealed against infection by excreta.

The author's conclusions are as follows:

1. Spina bifida associated with increasing hydrocephalus is inoperable.
2. Spina bifida associated with paralysis should be operated upon only for the purpose of preventing subsequent ulceration and rupture.
3. A rubber dam stitched at one margin to the skin below the tumor, adhesive plaster, and collodion should be used to prevent fæcal and urinary contamination.
4. The application of a light, rubber-covered clamp to the neck of the tumor is the safest method of preventing the loss of cerebrospinal fluid and of excluding infection from the cord.
5. Usually the sac can be tied off as in operations for inguinal hernia.

Jefferson, G.: Fracture of the Atlas Vertebra.
Brit. J. Surg., 1920, vii, 407.

The author presents 4 cases of hitherto unreported fractures of the atlas vertebra: 1 of the posterior

arch, 1 of the left lateral mass, and 2 pathological specimens, 1 from the Museum of the Royal College of Surgeons and 1 from the Pathological Museum of Manchester University. He reviews 21 reported cases of isolated fractures of the atlas, and 25 of complicated fractures. Of the 21 patients with isolated fractures, 7 died from the direct results of the injury, 3 died from other causes, and 11 recovered. Two of the patients who died were killed outright, 6 died from injury or infection of the cord, 1 from inspiration pneumonia, and 1 from secondary hæmorrhage. Of the 25 patients with fractures of the atlas complicated by injury to other vertebrae, 10 died from cord injury, 1 from tetanus, and 1 from nephritis, 1 was accidentally choked to death sometime after the injury, 2 were killed outright, and 10 recovered.

A table is given which indicates, in the order of their frequency, the fractures of other bones complicating those of the atlas, that is, fractures of the odontoid, axis, and lower cervical vertebrae and dislocation of the atlas on the axis.

In the entire series of 46 cases of fracture of the atlas recorded cord injury caused 16 deaths and most of these occurred in the cases of complicated fractures (3:2). Signs of cord injury were absent in 19 cases (11 isolated and 8 complicated), a fact which seems to indicate that fractures of the atlas produce cord lacerations far less frequently than fractures of other vertebrae. The site of fracture in the 46 cases presented was in the posterior arch in 25 instances, in the anterior arch in 16, and in the lateral masses in 7.

Indirect violence is important as a causative agent in fracture of the atlas. In 178 fractures of the cervical vertebrae, only 6 involved the atlas. Direct violence, except that of gunshot wounds, has little bearing on the mechanism of such fractures. Indirect violence has three results: (1) fractures of one or both arches due to transmitted force causing lateral spreading of the bone, (2) fractures of the posterior arch due to crushing between the occiput and neural arch of the axis with the head fully extended, and (3) fracture of the anterior arch by the odontoid when the head is in extreme extension.

The mechanism of the transmitted force in fracture of the atlas is not a direct straight-line force, but a force diverging in two directions. The force in falling on the head is transmitted through the two divergent arms. These divergent lines pass through the bone, separate the lateral masses from one another, deform the atlas into an oval with its long axis lateral instead of anteroposterior, and fracture the atlas at the posterior arch, the weak point in its ring.

Crushing between the occiput and the neural arch of the axis with the head in full extension has been advanced as the mechanism in fracture of the atlas vertebra, but the author believes this is not correct for although it is possible to make the bony parts approach one another, it is impossible to bring them into close contact without dislocating

the vertebræ. In many of the cases reported the head was not in full extension but in full flexion at the moment of striking the ground.

The outstanding clinical signs of fracture of the first cervical vertebra are rigidity of the neck muscles and limitation of movement. This is especially noticeable when the fracture involves the articular surfaces. When the patient supports the head with the hands on moving about it is very suggestive of fracture of the atlas. At times a protuberance will be found in the pharynx at the level of the palate which is painful on pressure, especially when the anterior arch is involved. In some cases crepitus has been recorded. Another symptom which is occasionally observed in rotatory dislocations is dysphagia and thickness of speech. It is not known whether or not this is of central or peripheral nerve origin. Owing to the very close relationship between the first two cervical nerves and the posterior arch of the atlas, important symptoms are referable to these nerves. Anæsthesia or neuralgia in the area of their distribution is very suggestive and in such cases the atlas should be examined carefully. The great occipital nerve passes below the posterior arch and suffers more than the suboccipital because of the more closely confined canal in which it runs.

Cord injuries are more often found in the complicated fractures and vary from monoplegias to complete paralysis of all four limbs. Cord injuries in atlas fractures are usually due to complicating fractures of other vertebræ rather than to the fracture of the atlas. A fracture of the atlas rarely causes these cord lesions because of the relatively large size of the neural compartment and the displacement of the broken fragments outward in the line of the applied divergent force. It is not surprising, therefore, that so few cord symptoms are observed in cases of isolated fractures of the atlas vertebra.

When a history of recent injury, especially a fall on the head, is associated with rigidity of the neck and limitation of head movement with anæsthesia or neuralgia of the great occipital nerve and a suggestive roentgenogram there should be no difficulty in establishing a definite diagnosis.

The author favors the conservative method of treating fractures of the atlas unless there are neurological signs and symptoms of cord compression, when laminectomy must be considered. So far, operative procedures have been attended with a high mortality, but the use of the Lorenz bed or Minerva plaster has given favorable results.

B. R. PARKER.

SURGERY OF THE NERVOUS SYSTEM

Bratrud A. F.: The Diagnosis and Treatment of Peripheral Nerve Injuries. *Minnesota Med.*, 1920, iii, 57.

Trophic changes are relatively insignificant when the limb has had active exercise, massage, and baths or electrical treatment to keep up the lymphatic and blood circulation.

When the musculospiral nerve has been injured there is inability to extend the forearm, the wrist, the proximal phalanges of the fingers, and usually the thumb. Occasionally, however, extension of the thumb is produced by the abductor pollicis through its median nerve supply which in some cases sends a slip to the dorsal expansion of the distal phalanx. The powerful supinator longus does not contract on flexion of the elbow.

In cases of paralysis of the median nerve the only important motion lost is flexion of the distal phalanges of the index finger and thumb. In some cases there is a median griffe consisting of moderate flexion of the distal phalanges of the thumb and the index and middle fingers. This is the result of contraction and adhesion of the flexor tendons and sheaths.

In ulnar lesions the motor loss is essentially a loss of action in the little and ring fingers and the intrinsic muscles of the hand. It is therefore impossible to abduct the fingers and extend the distal phalanges, adduct the fingers, or flex the proximal phalanx of the metacarpals. At times, however,

the compensation of other muscles is such that there is only a loss of abduction of the little finger.

Paralysis of the abductor pollicis is demonstrated by eliciting the prehension sign. Lesions of the fifth and sixth cervical roots cause involvement of the deltoid biceps, brachialis anticus, and supinator longus. If the lesion is sufficiently high up, i. e., in the roots, the winged scapula deformity will result. Involvement of the eighth cervical and first dorsal causes involvement of the intrinsic muscles of the hand. From the eighth cervical a median griffe may result, and from the first dorsal, an ulnar griffe.

In the U. S. Army General Hospital No. 26 treatment is not attempted until three months after complete healing of the wounds. The technique used is as follows: (1) forty-eight hour preparation of patient; (2) local and gas-oxygen anæsthesia; (3) excision of scar; (4) neurolysis or resection of neuroma; (5) end-to-end suture with fine silk, care being taken to prevent eversion of the sutured ends; (6) fat-fascia graft applied around nerve or nerve transplanted to muscle bed for protection; (7) autogenous or homogeneous grafts used to fill gaps so large that apposition of ends by transplantation of nerve or position of limb is impossible; (8) pedicled flap from chest used to replace extensive loss of tissue; (9) Carrel-Dakin treatment if infection is suspected; (10) loose suture of wounds; and (11) tendon transplantation if necessary.

R. B. BETTMAN.

Platt, H.: The Results of Bridging Gaps in Injured Nerve Trunks by Autogenous Fascial Tubulization and Autogenous Nerve Grafts. *Brit. J. Surg.*, 1920, vii, 384.

Lewis and Kirk have shown experimentally the regeneration of severed nerves in dogs by the use of fascial tubulization. Such methods, however, have not given uniformly good results when used on human beings. The series observed by the author includes 430 cases of nerve operations done from March 1, 1915, to October 31, 1919. In 46 instances end-to-end suture was deemed impossible.

Single nerve segments of smaller caliber than those of the recipient were used in every case. In 15 cases the grafts were sutured to the cross-sections of the proximal and distal nerve ends and surrounded by an autogenous fascial sheath which was then distended with sterile olive oil or vaseline. In 10 cases of peripheral nerve injury no nerve graft was

used, the ends of the nerves being connected instead by strands of fine catgut and surrounded by a fascial tube. In 1 case an autogenous vein graft was employed. The length of the gaps varied from $2\frac{1}{2}$ to 6 in. All patients received thorough after-treatment and were examined repeatedly.

Return of function must necessarily be slow, and its retardation should not be taken as evidence of failure. Retesting by electrical stimulation in the cases of 4 patients resulted in negative findings. The histologic study of the tissue is still incomplete. No proof of regeneration has as yet been found.

In 2 cases a change in the nerve syndrome followed operation. In 1, the motion was proved to be due to trick movements and as the field of the second operation was not re-explored the results cannot be explained.

The author concludes that early re-exploration of all graft and fascial-bridge operations is advisable.

J. I. MITCHELL.

MISCELLANEOUS

CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

Stowell, F. E.: The Treatment of Chronic Ulcers. *Boston M. & S. J.*, 1920, clxxii, 176.

Varicose ulcers, indolent non-healing ulcers of long standing, bed sores, and tubercular ulcers are similar in their essential pathology. Varying in size, they present a base covered with exudate and elevated edges covered with dead epithelium. In the surrounding area there is venous stasis with pigmentation.

In the treatment of these ulcers it is necessary to replace the venous blood with fresh arterial blood and to keep the ulcer base clean.

In cases of typical leg ulcer the author places the patient with the leg elevated in a chair on the insulated platform of the static machine. The bared foot and leg are washed with soap, rinsed with clear water or bichloride 1:2,000, and dried. The ulcer is cleaned with alcohol and gently curetted free from slough. Alcohol and a 50 per cent tincture of iodine are then applied.

The negative pole of the static machine is attached to the patient and the positive pole grounded. The ulcer and surrounding area are then treated with the static breeze and sparks.

This treatment relieves pain speedily, removes stasis, and stimulates healing. It is followed by the application of a dry or boric ointment dressing. The author emphasizes the importance of applying the bandage carefully, tightly, and with even pressure from foot to knee. The patient is allowed to be on his feet between the treatments which are given three times a week until the ulcer is entirely healed. A tight elastic stocking must then be worn permanently.

Osteomyelitis or tuberculous fistulæ respond to this treatment favorably. In tuberculous ulcers, the static breeze is preferable to the sparks.

Dichloramine-T may be substituted for the boric ointment.

Herpes zoster treated by the application of the static wave current to the spine at the point of origin of the affected nerve and of the sparks to the inflamed area is promptly relieved.

V. E. DUDMAN.

Solórzano, A. F.: The Application of the Abderhalden Reaction to the Urine as a Means of Diagnosing Cancer (Aplicación de la reacción de Abderhalden a la orina como un medio para el diagnóstico del cáncer). *Observador méd.*, 1919, i, 100.

As the kidney is the great filter of the body, Solórzano concluded that it is only logical to assume that the elements of cancer would be present in the urine and might be recognizable by means of some chemical reaction. To prove the soundness of his theory he applied the Abderhalden reaction to the urine.

As a dialyzer he used a wide-mouthed flask into which was inserted a glass tube open at both ends. Cotton was wound around the center of the tube so that it acted as a tight cork but still permitted the tube to be raised and lowered at will. The membrane was first washed with boiling water, dried, and then shaken for from thirty to forty minutes in a flask with equal parts of alcohol and ether. After drying it was submerged in chloroform for five minutes. The chloroform was drained off and the membrane tied over the lower end of the tube with a boiled thread.

Twenty-five cubic centimeters of sterile 2 per cent solution of sodium fluoride were then intro-

duced into the flask and the flask corked with the prepared tube and set in a water bath for thirty minutes in accordance with Gerard's technique for sterilizing. On its removal from the bath the tube was lowered so that the membrane came into contact with the fluoride solution. Then 5 ccm. of urine were introduced rapidly into the tube above the membrane with an aseptic pipette and the dialyzer allowed to stand for forty-eight hours at a temperature between 20 and 24 degrees C. At the end of this time dialysis had taken place. The tube was withdrawn from the flask, 10 ccm. of 10 per cent caustic soda solution were poured into the flask, and the flask was stoppered with sterile cotton and vigorously shaken. Then, by means of a fine pipette passed through the cotton stopper, 3 or 4 drops of a 5 per cent solution of copper sulphate were carefully dropped upon the surface of the liquid.

If the drops of copper sulphate solution fell to the bottom in ring form without losing their blue color, the reaction was considered negative. If they first spread out upon the surface and later the whole body of fluid showed a pink or violet-blue color, it was believed to be positive.

As albumin, peptone, blood, bile pigments, and other coloring matter in the urine give rise to error, the urine must be examined for these substances before it is tested and if any of these substances are present, they must be removed. Albumin may be removed in the usual manner. To remove peptone a quantity of the urine should be treated with half its volume of a very concentrated solution of tannic acid and sulphate of ammonia. The resulting solution should be shaken, allowed to stand in a cool place for twelve hours, and then filtered, the filtrate being used for the dialysis. The same method may be applied to urine containing blood or bile. If the urine is still colored after filtering it should be refiltered through charcoal. The urine to be used for dialysis should be as fresh as possible and kept under aseptic conditions.

Solórzano tested 11 specimens of urine of persons who had or were believed to have cancer. Of these, the tests were positive in 7 and negative in 4.

M. M. MATTHIES.

Mann, F. C.: Experimental Surgical Shock. *Am. J. Surg.*, 1920, xxxiv, Anæ. Supp., 11.

The writer reviews the results of the investigations of experimental surgical shock with special reference to its relation to anæsthesia. Emphasis is placed upon the fact that undoubtedly the condition termed "shock" by the surgeon is due to a large number of causes, and that experimentally it is very difficult to reproduce the environment and all the phenomena of such shock. The author discusses also the kinds of shock in which the anæsthetist is interested, the methods of producing experimental shock, and the probable factors involved.

All cases of shock may be divided into two general classes: (1) those cases in which the condition develops immediately after the action of the exciting

agent, and (2) those in which it does not develop until after an interval of time has elapsed. In the first group the nervous system is probably the main factor in the cause, and inhibition seems to be of more importance than excitation. In the second group the end-result and probably the cause of the symptoms is a loss of circulating fluid. In all probability many factors are capable of producing this loss of fluid. With regard to treatment, it is noted that the transfusion of blood appears to give better results than any other method.

Turck, F. B.: Traumatic Shock and Its Treatment. *Am. J. Surg.*, 1920, xxxiv, Anæ. Supp., 6.

In the author's opinion traumatic shock is caused by the toxins liberated from the wound itself. This theory he claims has been proved by extensive experimental and clinical studies. His investigations explain why débridement, which removes the devitalized tissue from the wound, prevents the poison of the dead tissues from spreading cell destruction to the normal tissues. Primary suture restores the circulation of the injured part and puts a stop to further cell necrosis.

Although Turck considers surgery far superior to the use of antiseptics in the treatment of traumatic shock, he does not advocate the employment of surgery in all cases. In fact most of the cases of traumatic shock which he had occasion to treat were cured without recourse to surgery. His treatment is both physical and biological rather than surgical.

The traumatic shock syndrome follows whenever destruction of tissue takes place. In the laboratory shock may be produced by simple ligation cutting off the blood supply of a part. The interruption of the circulation prevents the nourishment of the tissues below the ligature. Cell necrosis promptly follows. The changes taking place in the cell and tissue under these conditions have been well described by Virchow.

The following is a typical experiment which shows the relation between cellular disintegration products and traumatic shock:

A ligature (Esmarch) was placed around the thigh of a dog and a small portion of tissue immediately cut off from a point below the ligature. This tissue was at once frozen, cut, and stained. On examination, the cytoplasm and nuclei were found to be normal. A small portion of this fresh tissue was then rubbed up with salt solution and injected subcutaneously into the animal. No injurious effects were observed. The injured limb was then allowed to remain quiescent for three hours with a view to bringing about cell necrosis with alterations in the tissue albumins. Again a frozen section was obtained from a point below the ligature. On examination of the cytoplasm and nuclei it was evident that necrotic changes had taken place. The stain was indistinct and vacuoles were present. An emulsion in saline was then prepared from this disintegrated tissue and a small quantity of this emulsion injected subcutaneously into another dog. The syndrome of

shock followed with a fall in the blood pressure, a fall in the temperature, and death.

At autopsy, which was performed immediately, the most marked feature observed in this animal was splanchnic stasis. Section of the liver, lung, and upper alimentary tract showed that the blood had stopped in the pulmonary zone of the lung, the portal zone of the liver, and the submucosa of the upper alimentary tract. In other words, there was complete blood stasis in the splanchnic area which is the true primary pathogenesis of shock as described by the author in 1897.

In another animal the leg was gently massaged after the removal of the ligature so that the disintegrated or modified albumins of the necrosed tissue of the leg might be carried into the general circulation. This was followed at once by a drop in the temperature and blood pressure, shallow respiration, and death within a short time.

THE RELATION OF TISSUE DISINTEGRATION TO TRAUMATIC SHOCK

Animal	Character of site of injury	Release of ligature (hours after injury)	Appearance of shock symptoms (hours after release of ligature)	Death (hours after release of ligature)	Time of examination after symptoms of shock
Cat	Mangled upper part of thigh.....	2	2 1/2	5	..
Cat	Crushed lower part of thigh.....	2	2 1/4	6	..
Cat	Subcutaneous clamp thigh.....	1 1/2	3	8	..
Dog	Both thighs; constriction over iliac vessels.	2	2 1/2	7	..
Cat	Crushed thigh.....	1	2	..	6
Dog	Mangled upper thigh...	2	3	..	7
Dog	Crushing thigh clamps.	1	2	9	..
Rabbit	Mangled thigh.....	2	2 1/2	6	..
Rabbit	Extensive wound, upper and lower thigh.....	1 1/2	2	7	..
Rabbit	Mangled thigh.....	2	2 1/2	24	..
Cat	Crushed thigh.....	1 1/2	2	36	..
Cat	Mangled thigh.....	2	2 1/2	..	5
Rabbit	Mangled thigh.....	2	3	24	..
Rabbit	Crushed thigh.....	1	2	..	4

It is evident that in the treatment of traumatic shock the aim must be to remove the blood stasis of the splanchnic area and neutralize the toxins.

The toxins resulting from cell necrosis may be neutralized by the employment of a specific immune horse serum. This serum is produced by immunizing horses with properly prepared human autolyzed tissue protein. If autolyzed human tissue is injected into horses from time to time for a period of about six months, the animals develop in their blood specific antibodies against human products of tissue autolysis. Such immune serum subcutaneously injected into patients suffering from traumatic shock has given remarkably favorable results.

The underlying difficulty in cell necrosis is the fact that iso-autolyzed tissue resulting from the necrosed cells enters the circulation and causes poisoning. The use of a serum containing antibodies against human autolyzed tissue, therefore, is the only logical treatment against the poisonous autolyzed tissue due to cell necrosis.

The article is summarized as follows:

Traumatic shock is the result of two underlying factors: (1) marked stasis in the splanchnic area, and (2) toxæmia resulting from the autolization products of cell necrosis.

The treatment is directed primarily to overcoming the splanchnic stasis by means of heat in accordance with a well-established principle of colloidal reactions, and to overcoming the poisoning due to the products of cell necrosis by means of an immune serum containing antibodies against human autolyzed tissue.

Perez, A. M.: Septic Gaseous Embolism (Embolia septica gaseosa). *Rev. de med. y cirug. práct.*, 1920, CXXVI, 5.

A case of thrombosis of the femoral artery was treated with heat to dilate the vessels, with oxygen baths, and with iodides given internally. A few days after this treatment was begun dry gangrene was noted on the external side of the foot. The entire extremity was then treated with an oxygen bath and the gangrenous area cauterized by means of the thermocautery. The circulation seemed improved and the cauterized gangrenous portion sloughed away, leaving the base of the fifth metatarsal bone, the cuboid, and the insertion of the peroneus brevis muscle exposed. The pain ceased, and granulation had begun when alarming symptoms—chills and fever, chest distress, cephalalgia bordering on delirium, and a temperature of 41 degrees C.—developed. These symptoms lasted for thirty hours although a complete physical examination made during that time was entirely negative. At the end of this period they disappeared quite rapidly and the patient's progress was good for several days. The syndrome then reappeared with greater intensity and continued longer than in the first attack. The patient again recovered but a third attack soon followed and was so severe that no hope of recovery was entertained.

In consultation it was decided that septic gaseous embolism furnished the only possible explanation of the condition. It was concluded that the stagnated venous blood had decomposed with the production of numerous gaseous bubbles and that the symptoms observed were due to the entrance of showers of these bubbles into the general circulation. As it seemed probable that another attack would prove fatal, amputation was advised. This was refused but there was no further trouble. The ulcerated surface granulated nicely and the patient regained the use of the extremity to such an extent that he was able to walk fairly well with the aid of a cane.

W. R. MEEKER.

Blanc y Fortecin: Surgical Complications of the Influenza in Children (Complicaciones quirúrgicas de la gripe en los niños). *Med. Ibero*, 1919, iii, 201.

The recent epidemic of influenza has left many complications the therapy of which is surgical. The authors have had occasion to observe cases of peritonitis, pleuropneumonia, perinephritic abscess, and osteomyelitis.

In one case of pneumococcus peritonitis resembling acute appendicitis a laparotomy was performed. Of the pleuropulmonary complications empyema was most common. In these cases aspiration was done until the fluid became thick and purulent, when a thoracotomy with rib resection was performed and followed by irrigation with hypochlorite solution. If fever returned after the operative wound was closed, the opening was dilated and irrigation was re-established. When the bacterial content, as determined by successive microscopic examinations of the exudate, was decreased sufficiently iodine was used and later the remaining tract was closed with bismuth paste.

Perinephritic abscess, osteomyelitis, suppurative mastoiditis, and arthritis, which were less frequent, were treated by the usual methods. In rebellious cases of arthritis vaccine therapy was employed.

W. R. MEEKER.

Rowan, C. J.: The Surgical Complications in 1,030 Cases of Influenza. *J. Iowa State M. Soc.*, 1920, x, 44.

In 1,030 cases of influenza among the students of the University of Iowa in October, 1918, the consequent surgical complications were not numerous or severe.

Empyema was the most important complication and was present only in cases in which pneumonia developed. Otitis media complicated the empyema in 3 cases and scarlet fever in 1. Two patients died from empyema.

Appendicitis was rare but was simulated by gastro-intestinal influenza. Leucocytosis indicated the presence of appendicitis in 2 cases, and in these appendectomy was done. In one, the appendix was acutely inflamed and showed beginning gangrene. In the other the condition was apparently not acute and the leucocytosis was probably due to sigmoiditis.

Acute otitis media was present in 37 cases and in 5 of these mastoiditis developed. There were 14 cases of acute involvement of the paranasal sinuses and 12 cases of acute laryngitis. All of these patients showed a leucocytosis except one and this one died of pneumonia. The marked tendency to cellulitis in cases of infection of the anterior ethmoids was noteworthy, there being 3 such cases among those of paranasal infection.

The influenza bacillus was not found in any of the cases. The few complications of influenza were probably due to a secondary infection which was indicated by the development of the leucocytosis

with the onset of the symptoms. The bacteria most concerned in the complications were pneumococci and streptococci.

MARCUS HOBART.

Faure, J. L.: Influenza and Surgery. *Med. Press*, 1920, cxix, 92.

In modern surgery the attention is focused almost entirely upon the aseptic technique of the surgeon and his assistants and the aseptic condition of utensils and materials. The air as a source of infection should also be considered. This view was confirmed by the author's experience in the recent influenza epidemic.

During the time of the epidemic in Paris in January, February, and March, 1919, Faure's operations were attended by many complications. Several cases of embolism and phlebitis developed after surgical treatment of such conditions as appendicitis and cancer of the breast. The date of these complications was coincident with the apogee of the epidemic, and they subsided with the decline of the epidemic. In obstetrical cases, also, the mortality was increased in normal labors during the epidemic.

Embolic complications were the most frequent and it seemed probable that the infection in its multiple and varied forms induced changes in the blood which set up coagulation.

During the second influenza epidemic, which reached its climax between February 16 and 23, the author had 3 deaths from septicæmia, 4 cases of embolism with 2 deaths, and 1 case of bronchopneumonia. With the decline of the epidemic, his operative complications diminished and at the end of March, conditions had returned to normal.

MARCUS HOBART.

SERA, VACCINES, AND FERMENTS

Zagari, E.: The Physiological, Therapeutic, and Especially the Dynamic Action of Isotonic Glucose Solutions Given by Hypodermoclysis (Sull'azione fisiologica terapeutica e soprattutto dinamogena delle ipodermoclisi glucosate isotoniche). *Riforma med.*, 1919, xxxv, 972.

On the basis of experimental investigations the author enumerates the effects of isotonic glucose solutions given by hypodermoclysis as follows:

1. A local reaction manifested by a more or less diffuse and painful erythema about the site of the injection which disappears after two or three days.

2. A general reaction manifested by an increase in the temperature which continues for several days. This is usually observed the day after the first hypodermoclysis but is not repeated following consecutive injections given at intervals of two or three days.

3. An increase in the work of the voluntary muscles demonstrated by the ergograph after each injection. This becomes more manifest after a series of injections and continues for about ten days after the treatment is suspended.

4. A decrease in the excitability, especially the reflex excitability, of the muscles.

5. An increase in the muscular tone as measured by the myotonometer.

6. A very slight increase in the muscular force.

7. A very slight action on the cardiovascular pressure.

8. A notable diuretic effect. This is usually observed the day after the injection and becomes more marked as the number of injections is increased. It continues for several days after the treatment is stopped.

In spite of the local and general reactions mentioned, isotonic glucose solutions are usually well tolerated and because of their dynamic and diuretic effect are preferable to physiological salt solution even when sodium chloride is not contra-indicated.

W. A. BRENNAN.

Warwick, M., and Nixon, C. E.: A Study of the Colloidal Gold Reaction and Its Clinical Interpretation. *Arch. Int. Med.*, 1920, XXV, 119.

The authors summarize the results of their investigations of the colloidal gold reaction as follows:

1. The colloidal gold test is the most delicate of the routine spinal-fluid reactions.

2. With careful technique and proper attention to neutrality every laboratory worker should obtain successful colloidal gold solutions.

3. The colloidal gold reaction does not replace any other test but is of independent value.

4. It is of special importance in the early diagnosis of neuro-syphilis, the various curves, though not specific, being of great diagnostic value in conjunction with other clinical and laboratory findings.

5. A colloidal gold curve may be obtained with or without other positive findings after provocative treatment.

6. The colloidal gold curve does not parallel clinical signs nor give definite evidence of improvement under treatment.

7. Patients with no involvement of the central nervous system or who are non-syphilitic have no colloidal gold curve.

8. In clear-cut clinical cases of tabes dorsalis all the spinal-fluid reactions may be negative both before and after treatment.

9. A curve in Zone 3 with a negative cell count and negative or faintly positive globulin is strongly suggestive of the presence of a brain or cord tumor or myelitis.

10. Curves in Zones 1 and 2 may be found in non-syphilitic conditions such as multiple sclerosis and brain abscess.

11. A cell count above 5 is pathologic, but the cell count is of no value in indicating the duration or severity of the process or improvement.

12. The colloidal gold reaction should be included in every spinal-fluid and neurological examination as well as in the examination of all cases of general syphilis.

G. E. BEILBY.

BLOOD

Henry, C. K. P.: Blood Transfusion. *Canadian M. Ass. J.*, 1920, x, 166.

The indications for blood transfusion as given by the author are: (1) a deficiency in the quantity of blood as in posthæmorrhagic anæmia and secondary anæmias due to chronic sepsis; (2) a deficiency in the quality of the blood as in pernicious anæmia and hæmolytic jaundice; and (3) a deficiency in the clotting power of the blood due to a deficiency of thromboplastic substances such as is found in hæmophilia.

In the author's opinion transfusion is most successful in post-traumatic anæmia and is of no benefit in shock without anæmia.

Infusions of gum arabic and saline solution are not beneficial as these substances are rapidly lost from the blood channels, they fail to increase the oxygen-carrying capacity of the blood, and they do not increase the hæmostatic or hæmatopoietic functions of the blood.

Among the conditions for which transfusion is indicated are traumatism, gastric and duodenal ulcer, postpartum hæmorrhage, ruptured ectopic pregnancy, typhoid hæmorrhage, bleeding hæmorrhoids, dangerous postoperative procedures, postoperative hæmorrhage, jaundice, chronic sepsis, and poisonings due to benzol, illuminating gas, etc. It is of no value in acute sepsis or septicæmia.

Tests of agglutination and hæmolysis are always necessary. Simple methods have been devised for these tests. As occasionally the reaction of a given donor to a given recipient changes, it is advisable to make the tests before each transfusion. Citrated blood may be stored and kept for use up to four weeks after its withdrawal.

The citrate method of transfusion is the simplest and most adaptable. In the author's opinion Pemberton's method and apparatus give the most satisfactory results. The Kaliski needle, Gauge 11, can be introduced directly into the vein unless the patient is exsanguinated, in which case dissection of a vein is sometimes necessary. The citrate solution must always be freshly prepared and sterilized before the blood is drawn. An 8-inch rubber tube is attached to the needle and by this the blood is conducted to the beaker and kept away from the air. This tube may be filled with citrate solution to prevent clotting.

The mixed blood and citrate is run into the recipient's vein by means of a salvarsan set. The mixture may be kept for future use in an Erlenmeyer flask fitted with a two-tube cork. Air pumped into the flask through one tube increases the pressure so that the blood mixture is forced through the other tube into the recipient's vein.

The results obtained by transfusion are summarized as follows:

1. Following transfusion in cases of hæmorrhage due to war wounds the patients recovered from shock, underwent major operations, and were

evacuated to the base hospital in good condition. In addition to the transfusion, the treatment included heat, rest, quiet, morphia and fluids by mouth and rectum.

2. Patients with anæmia due to disease were greatly benefited.

3. In pernicious anæmia transfusion was followed by great improvement in the general well-being and in the blood count but the fatal outcome was at best only postponed.

4. In cases of chronic sepsis the range of temperature was lowered and the body metabolism decreased.

The reactions following transfusion are often disagreeable and annoying but harmless and temporary. They occur in from 20 to 40 per cent of transfusions even when the recipient and donor belong to the same blood group. They are marked by a rise of temperature of $2\frac{1}{2}$ degrees, chills, and vomiting.

Frequently repeated transfusions may result in hæmolysis from the formation of iso-hæmolysins. These reactions are not due to the citrate or the method but occur less often as the technique is perfected. They are due to the cellular elements of the blood.

Agglutination causes a rapidly increasing reaction in the first few minutes of the transfusion, usually as soon as 50 or 75 ccm. of blood have been injected. Hypodermic injections of adrenalin and atropine are of value in checking these effects. Hæmolysis reactions rarely begin until fifteen minutes after the completion of the transfusion, usually later.

In hæmorrhage of the new-born 10 ccm. of whole blood injected subcutaneously will usually be sufficient to stop the bleeding.

The donor may be any healthy person with a negative Wassermann test who belongs to the same blood group as the recipient. Only one of the author's donors suffered even temporarily as a result of the transfusion. This man was affected with lassitude for several weeks after donating 850 ccm. of blood. One patient died from arrest of kidney function with anuria and toxæmia due to hæmolysis.

MARCUS HOBART.

BLOOD AND LYMPH VESSELS

Goyanes, J.: The Present Status of Surgery of the Arteries (Estado actual de la cirugía de las arterias). *Prog. de la clín.*, Madrid, 1919, vii, 235.

In a complete review of the history and present status of arterial surgery the author urges a more thorough study of experimental surgery of the arteries. He divides the operation of lateral suture into four stages: (1) the preparation of the damaged vessel, (2) the securing of hæmostasis, (3) the suturing, and (4) the removal of hæmostatic ligatures and the checking of the hæmorrhage along the line of suture. When it is possible to use an Esmarch bandage this is preferred. Hæmorrhage along the line of suture is usually controlled by compression,

a second line of reinforcing sutures rarely being necessary.

In circular suture the author recommends a technique by which endothelial coaptation is obtained by the sutures alone without the aid of instruments to release tension as recommended by Carrel. Of the methods of obtaining circular union by means of foreign substances he prefers the method of Payr.

In the treatment of aneurism the ideal procedure is one which re-establishes the vascular canal without too much dependence on collateral circulation. Extirpation of the sac with lateral suture of the excised margins, circular suture after extirpation of the sac, and transplantation of a segment of vein after excision in the case of a popliteal aneurism have been practiced successfully. The operation of San Martin, designated by the Germans as the Wieting operation, was used with good results in a case of arteriosclerotic gangrene. Arteriotomy with extraction of thrombi followed by closure has often been successful.

W. R. MEEKER.

Hill, L.: Blood Vessels and Pressure. *Lancet*, cxviii, 359.

In regard to the principles of the cerebral circulation it is pointed out that the pressure of the brain against the skull wall, the pressure of the cerebrospinal fluid, and the venous pressure in the torcular herophili are always in equilibrium. These pressures signify that the arterial pressure remaining after the resistance is overcome, that is, the capillary-venous pressure, expands the brain.

The author shows that gravity exerts an effect on the circulation. In man the difference between the pressure in the arm and leg is equal to the height of a column of blood between them. In a convalescent patient arising from bed for the first time the soft flabby muscles and relaxed abdominal wall may not adequately support the blood against the force of gravity and as a result the blood sinks down and a feeling of faintness or actual fainting ensues.

If the wall of an artery is contracted and more or less rigid it conducts the crest of the pulse wave much better than if it is soft and slack. In the latter case the crest of the pulse wave is spent in distending the walls of the artery. The author is of the opinion that in renal disease it is the cells strangled by inflammatory processes which call for the hammer-like stroke; hence the high systolic blood pressure. The danger of cerebral hæmorrhage arises not from the high blood pressure but from the vascular degeneration set up by abnormal metabolic conditions.

When the arterial pressure is raised by the constriction of the arteries, the rise is due wholly to the increased resistance therein rather than to a reduction in the total capacity of the vascular system. The author lays great stress on the importance of the tissues surrounding the vascular system in the maintenance of efficient circulation. The respiratory movements, the intestinal contractions, and the movements of the skeletal muscles are all de-

signed to squeeze the blood from the capillaries and keep the pressure within them very low. It is the swelling or shrinking of the cells of the tissues, particularly of muscle, that controls the width of the capillaries.

The cells of the body are inclosed in membranes which permit inhibition of fluid but check swelling, thus enabling the cells to do their work and at the same time receive a normal blood supply. Edema is not due to filtration, but to an obstruction of the flow of blood which leads to a want of oxygen, metabolic changes in the cells, and increased inhibition. Shock also is considered due to metabolic products which open up all the capillaries and increase the inhibition of all the cells of the body at the same time.

G. S. FOULDS.

GENERAL BACTERIAL INFECTIONS

Fry, H. J. B.: *The Use of Immunized Blood Donors in the Treatment of Pyogenic Infections by Whole Blood Transfusion.* *Brit. M. J.*, 1920, i, 290.

The author reports the effects of transfusions of from 450 to 900 ccm. of blood from immunized donors upon 9 patients who were suffering from chronic wound infections. In some of these cases the infection was associated with septicæmia. All of the patients were in an extremely bad condition and 7 were moribund.

The donors were immunized with a mixed vaccine prepared from 1 strain of staphylococcus aureus and 10 strains of streptococcus isolated from the knee joints of patients with septicæmia, hæmaturia, etc. The organisms were grown in broth containing human serum and the cultures sterilized by cold in the ice chest. From 3 to 9 injections of vaccine were given each donor.

Vaccine was administered to patients who appeared benefited by a transfusion. From 1 to 4 transfusions were given. When necessary, bleeding was done as a preliminary measure. Four of the 9 patients recovered.

The fact that 2 of these patients were practically moribund when treatment was instituted and 2 recovered promptly from wounds which had previously resisted treatment leads the author to the conclusion that further trial of this method is advisable. He suggests its use in the treatment of malignant endocarditis, acute and chronic suppurative bone and joint infections, and puerperal septicæmia.

WINIFRED ASHBY.

SURGICAL DIAGNOSIS, PATHOLOGY, AND THERAPEUTICS

Hull, A. J.: *The Paraffin Treatment of Burns.* *J. Roy. Army Med. Corps*, 1920, xxxiv, 151.

The burn is first washed with normal saline (or a 1:1,000 solution of flavine or proflavine) and then dried with gauze or an electric dryer. A layer of paraffin is then applied at a temperature between 55

and 60 degrees C. Over the paraffin is spread a thin layer of wool, and over the wool a second layer of paraffin. Then another layer of wool and a bandage are applied. This dressing is changed every twenty-four hours. It is important to apply the paraffin in sufficiently thick layers and at the correct temperature.

By the method described the epithelium is conserved from damage and the tissues are held at rest. It was found that paraffin to which antiseptics were added gave better results than paraffin not containing antiseptics. Experiments to improve the base demonstrated that No. 7 paraffin is the best. The first antiseptic combined with the paraffin was eucalyptus oil used with beta-naphthol. Later flavine was employed and gave very satisfactory results. Paraffin preparations of brilliant green and chloramine-T were not satisfactory from a pharmaceutical standpoint.

In other experiments it was found that excellent results were obtained when the antiseptic was painted on the wound before the application of the paraffin. Accordingly, with the exception of flavine paraffin and scarlet-red, the special paraffin preparations have been discarded.

In studies of the effects of the various antiseptics it was found that eusol accelerated the cleaning of the burn but was too irritating in its action. Brilliant green cleaned the wound well but if used beyond a certain stage caused the formation of light-colored and unhealthy granulations. Flavine cleaned the surface well and produced a healthy type of granulation. Scarlet-red should be used only when the burn is clean and requires stimulation. The aqueous solution should be painted over the wound before the application of the paraffin. Both a 1 per cent and a 10 per cent solution have been tried but in most cases the former was sufficient. The treatment giving the best results and obviating pain, sepsis, and other complications is preliminary painting of the wound with a 1:1,000 aqueous solution of flavine followed by the application of No. 7 paraffin. In burns of long duration a 1 per cent solution of scarlet-red should be substituted for the flavine.

I. W. BACH.

EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

Albee, F. H., and Morrison, H. F.: *Studies in Bone Growth; An Experimental Attempt to Produce Pseudarthrosis.* *Am. J. M. Sc.*, 1920, clix, 40.

These experiments, which supplement earlier investigations, were made by the authors in the laboratory of the U. S. Army General Hospital at Colonia, N. J. From the earlier experiments it was learned that bone cubes cut from the vertebrae of animals were much less active osteogenetically when placed in a muscle belly than cubes of the same size taken from the shaft of a long bone of a dog. It was found also that the periosteal transplants which were obtained by scraping the outer surface of the bone

with a sharp instrument showed greater osteogenetic powers than transplants of periosteum separated in the line of cleavage by blunt dissection. In fact, the latter grew only in those places where portions of the cambium layer happened to come away with the so-called "limiting membrane." The inadvisability of using heterogeneous bone transplants was also demonstrated.

The research work on animals here reported included: (1) an experimental study of pseudarthrosis with reference to the influence of the roentgen ray upon callus formation, and (2) an attempt to discover some artificial stimulus to osteogenesis.

In considering the etiology of pseudarthrosis or malunion the question arises as to whether or not modern methods of living have increased the condition.

In the opinion of one Canadian surgeon the change of diet in Canada necessitated by the recent war seems to have resulted in a greater number of cases. Syphilis as a cause of the disease the authors believe has been greatly overrated. Causal factors of importance are: (1) the method of splinting (including the type of splint, its adjustment, the time it is first applied, and the length of time it is worn) and the character of the massage and traction; (2) the diet; (3) the location of the nutrient artery with respect to the fracture; (4) the presence of systemic disease such as lues or atrophic conditions; (5) the internal application of the metal splint (in the authors' opinion this is the most frequent cause of pseudarthrosis); and (6) the roentgen ray.

Adult rabbits were used in these experiments. Under aseptic conditions $\frac{1}{4}$ in. of bone was removed from each animal. The results are summarized as follows:

1. In none of the experiments on rabbits was pseudarthrosis produced by repeated massive doses of the roentgen ray, removal of bone, or various degrees of splinting. Even though as much as one-quarter of the entire length of the bone was removed, the bones united rapidly.

2. Frequent massive exposures to the roentgen ray of fractures with or without loss of bone in no wise inhibited callus formation. Apparently the ray does not exert any appreciable influence upon bone growth in rabbits.

3. In cases of fracture with loss of bone in which all bone fragments were removed from the hiatus in the shaft of the radius the average time for union was forty-two days.

4. Cases of fracture in which fragments were allowed to remain in the hiatus showed a much more rapid and complete union than those in which the fragments were removed. In a case in which one fragment of bone bridged the gap complete restoration of continuity occurred in thirty-one days. This suggests the value of the osteoperiosteal or sliver graft to furnish additional foci for bone growth.

MARCUS HOBART.

Keith, A., and Hall, M. E.: *Specimens of Long Bones Showing the Processes of Infection and Repair*. *Brit. J. Surg.*, 1920, vii, 302.

The authors have made a detailed study of a large number of specimens contained in the British War Office Collection. The effects of gunshot fracture of the long bones are well illustrated. The cuts are clear and well described and show in a striking manner the related processes of infection and repair.

In civil practice fractures of the long bones, explosive effects, and comminution are rare. When present, the fragments are not scattered and generally retain their circulatory connections.

Gunshot wounds, however, produce marked comminution of the bone with extensive tearing and laceration of the surrounding tissues. The bone fragments are generally widely scattered and because of the loss of their blood supply become foreign bodies. Coaptation is often prevented and the fragments are a marked hindrance to callus union.

Several specimens in which the healing process extended over a few weeks showed that the bone margin was dead for a distance of several millimeters bordering the fracture line. Before union can take place such areas of dead bone must be removed. Occasionally fragments were seen entirely surrounded by such a rim of dead bone. The authors hold that this destruction of the fracture margin is due probably to the shock produced by the missile which at the same time destroys the blood supply to the affected areas. The stripping off of the periosteum is probably of minor importance. When esquillectomy is done the ends of the main fragments must also be removed; otherwise they tend to form sequestra and later make a second operation necessary. The portions of bone which die at the time of injury remain smooth and unaffected, but those that survive show the results of the action of infective agencies. Infection is not always detrimental; in some specimens there was evidence that a certain amount of infection stimulates new bone formation. In many specimens exuberant callus buds could be seen between points of infective erosion. The new bone thrown across the fracture line had been extensive and effective.

The authors suggest that early operation is indicated and that the increased circulation and tissue proliferation found at the sites of infection can be used as an aid to reparative interference. Callus produced in the presence of infection was loosely constructed and in a number of specimens definitely lacy in appearance.

The authors distinguish three distinct types of sequestra, all of which prevent union and should be removed shortly after injury: (1) loose dead fragments of bone separated at the time of injury; (2) loose fragments of bone which apparently survived the injury, but later become necrotic and extensively eroded on account of severe sepsis; (3) areas of dead bone along the fracture lines which can be separated from the surviving portion only by operative procedures or the slow process of linear liquefaction.

Attention is directed to the tendency of fine fissure fractures to extend along the shaft of the bone. These small linear fractures are potential channels of infection and several specimens in the War Office collection show infection of a joint following injury at some distance from the articulation.

A. J. SCHOLL, JR.

ROENTGENOLOGY AND RADIUM THERAPY

Nakahara, W., and Murphy, J. B.: Studies on X-Ray Effects. V. The Effect of Small Doses of X-Rays of Low Penetration on the Lymphoid Tissue of Mice. *J. Exper. M.*, 1920, xxxi, 13.

The destructive effect of the X-ray on lymphoid tissue was noted early in the study of the biological effects of this agent. Its stimulating action on the circulating lymphocytes was first observed in the laboratory of the Rockefeller Institute and was applied experimentally in the study of the spontaneous tumors of mice. The earlier work was carried out with the old type of gas tube with which it was difficult to regulate the amount and character of the rays used, and therefore no attempt was made to standardize the dosage. This difficulty was largely overcome by the use of the Coolidge tube. The stimulating dose for rabbits was reported by Thomas, Taylor, and Witherbee. The work of Russ, Chambers, Scott, and Mottram confirmed the authors' earlier observations on the stimulating action of the rays on mice.

In the experiments with rabbits a histologic study paralleling the blood counts confirmed the general nature of the stimulation by showing a marked increase in the number of mitotic figures in the germinal centers of the lymphoid organs. As in the authors' experiments mice were used most extensively, it was believed important to duplicate the histologic study of the lymphoid organs of these animals after stimulating doses of X-rays. With this end in view a series of five experiments was carried out.

The uniformity of the changes both in extent and period of occurrence in three of the experiments could not be considered a mere coincidence. It was concluded, therefore, that the small dose of X-rays employed was capable of stimulating the lymphoid tissue of mice to proliferation.

In this connection, the apparent relation between the extent of cellular destruction and the degree of cellular stimulation was of interest. It seemed from these observations that after too much or too little destruction, slight proliferation occurred.

From their present knowledge of the subject the authors believe that the quantitative increase of the lymphoid elements in the body is due mainly to the hyperactivity of the lymphoblastic tissue of the lymphoid organs which results in hypertrophy of lymphoid organs, especially of the malpighian bodies, and lymphocytosis in the blood. As regards the number of these cells thrown into the circulation, it is theoretically conceivable that individual animals

may react differently to equal stimulation of the lymphoid organs. Cases have been observed in which the blood lymphocytosis was due apparently to the mere emptying of the lymphoid organs without any corresponding actual increase of the lymphoid cells and the histologic studies here reported have given more nearly uniform evidence of stimulation than the blood counts.

The authors conclude that stimulation of lymphoid tissue in mice is effected by X-rays administered under the following conditions: spark-gap, $\frac{1}{8}$ in.; milliamperage, 25; distance, 8 in.; time of exposure, ten minutes. Within four days an abnormally large number of mitotic figures appeared in the lymphoid tissue of the spleen and in the lymph glands, indicating an acceleration of the proliferative activity of the tissue.

G. E. BEILBY.

De Niord, D. R., Schreiner, B. F., and De Niord, H. H.: The Effect of the Roentgen Ray on the Metabolism of Cancer Patients. *Arch. Int. Med.*, 1920, xxv, 32.

This study was undertaken to ascertain whether the loss of weight in cancer patients is due to deficient food intake, the absorption of toxins from secondary infection of the tumor, or some specific action of the cancer cells which prevents the storage and utilization of foodstuffs.

The marked improvement of many patients following radium and roentgen-ray treatment raised the following questions: Does the roentgen ray produce any discernible change in the blood chemistry? How long must such a change continue to effect general improvement in the metabolism? Is the effect of the roentgen ray general or only local?

To answer these questions 41 patients who were being treated with the roentgen rays were examined relative to their blood chemistry. The findings were recorded immediately before roentgen-ray exposure and one-half hour and approximately twenty-four hours afterward. Urea, creatinin, uric acid, chlorides, cholesterol, fatty acids, total fats, sugar, diastatic activity, and the plasma and corpuscle percentages were estimated.

The patients studied were not taken at random; in order to exclude cases of retention only those were selected who were practically free from renal disease. Several control studies were made on normal persons subjected to the same roentgen-ray exposure. From another control group of cancer patients 60 ccm. of blood were taken at the same intervals as the roentgen-ray exposures were made. Beside the chemical data, the article contains also short histories of the cases treated.

The following conclusions were drawn:

1. The urea, urea nitrogen, and creatinin show nothing characteristic in cases of cancer.
2. The moderate uric acidemia which is present for a short time after exposure to the roentgen rays is the result of nuclear degeneration but is not especially characteristic of malignancy.

3. The sodium chloride content of the blood of cancer patients is not altered by the presence of the tumor or by exposure to the roentgen rays.

4. The cholesterol, fatty acids, and total fats are generally increased in cases of malignancy. Cholesterol is increased in the blood, but this increase is not in proportion to the duration of exposure to the roentgen ray nor does it vary with the type of tumor. The increase of cholesterol in the blood is due probably to cellular autolysis and liberation of cholesterol induced by the action of the roentgen rays. Fatty acids and total fats are consistently high in the blood of cancer patients and are reduced by the roentgen rays.

5. There is nothing in the behavior of the blood sugar or diastatic activity that is diagnostic of cancer. It was noted, however, that the roentgen rays activated the diastase for a short time to an activity greater than normal.

6. The plasma and corpuscle percentages were unaltered by the rays and proved of no diagnostic value in cases of cancer. ADOLPH HARTUNG.

MILITARY SURGERY

Jones, R.: Joint, Nerve, and Other Injuries in War Surgery. *Surg., Gynec. & Obst.*, 1920, xxx, 1.

Malunion and non-union of fractures, especially in the femur; stiff, ankylosed, and flail joints; the after-effects of injuries to peripheral nerves; and deformities due to the contraction of scars were frequently observed by the author on his tours of inspection of British war hospitals. As a rule the patients had been in several hospitals and were unwilling to undergo further manipulation or operative treatment. By persuasion, explanation, and efforts to improve their mental outlook, however, their attitude was soon changed and they agreed to take any treatment prescribed.

From visits to the large camps it became evident that it would be necessary to establish hospitals providing accommodation for the type of case which required a sufficiently protracted stay to prevent deformity and restore function. At first 250 beds were reserved for such cases in Liverpool. Later this number was increased to 1,500 and fresh centers were started also in Great Britain and Ireland until ultimately there were more than 25,000 beds.

For musculospiral paralysis the author recommends the same operation he advised in pre-war days but advocates the more frequent use of the pronator radii teres. The flexor carpi radialis and ulnaris may be transplanted into the paralyzed extensors of the thumb and fingers and the pronator radii teres may be fixed to the radial extensors. In transplanting tendons it is important to obtain the proper tension. For this purpose the hand and fingers should be kept well dorsiflexed when the attachments are being made. If the operation is a success the fingers and thumb can be extended fully with ease.

Paralysis of the anterior crural was very rare, probably because the femoral vessels were usually destroyed by the missile. There is here a choice of hamstrings to attach to the patella. The author has seen a transplantation of this kind done only once and in this case the operation was very successful.

Twenty years ago Tilanus of Holland recommended the operation of tenodesis for flail feet in poliomyelitis. Later Gallie and others worked along similar lines. The tibialis and peroneal tendons are passed through a tunnel bored through the tibia, and act as suspensory ligaments. In the author's experience this type of operation has been very successful.

In 1917 Jones described gunshot injuries of the femur as the "tragedy of the war" because they so often resulted in shortening and frequently were fatal. These results he attributed to lack of teamwork in the treatment, of standardization of principles and splints, and of continuity of treatment from the front line hospitals to the base hospitals. In 1916 the mortality from such fractures amounted to 80 per cent. In 1918 it had been reduced to less than 20 per cent. A factor in this decrease and in the reduction in the number of cases of malunion and non-union of such fractures was the Thomas splint.

The standardization of the Thomas splint, the education of surgeons in its use, and its application on the field of battle secured immobilization, simplified transportation, minimized shock, and prevented further injury by the bone fragments. Eventually the improvement in these cases led to the establishment of special hospitals for cases of fracture of the femur. In 300 cases of compound fracture in one of these hospitals the average shortening was $\frac{1}{2}$ in.

There can be no doubt that the use of caliper ice-tong splints in the hands of experienced surgeons has been of very great service but the author believes the guard should always be affixed to prevent penetration into the medulla. It should be borne in mind, moreover, that with the use of the Thomas splint fractures of the femur can be effectively treated with ordinary extensions. In 97 cases treated at the Liverpool Special Military Surgical Center the average shortening was $\frac{5}{8}$ in.

Extension calipers with the knee joint free should never be used for transport purposes. The author decries the use of plates, screws, and other internal splinting when good results may be obtained by so much simpler means. The use of the Thomas splint extending into the heel of the boot is advised especially when there is danger of angulation several months after apparent union.

The most common cause of non-union was loss of substance. Esquiectomy, though at times unavoidable, accounted for many of these gaps which did not fill in. At the time of injury it is quite impossible to say that a loose piece of bone has no blood supply. In the later stages of treatment apparently loose pieces lying in suppurative areas

were found to have osteogenetic power. This fact has led the author to advise the maintenance of the length of the limb rather than the approximation of the bone ends. Ununited fractures of the femur with loss of bone should be kept in caliper splints, and rubber tubes should be inserted above and below the fracture. Such treatment will increase local congestion and osteogenesis.

In many cases of non-union of fractures of the humerus the cause was too-prolonged and too-powerful extension and sometimes the injudicious use of the Thomas splint. The Thomas arm splint is essentially a transport splint and its prolonged use may result, not only in non-union, but also in ankylosis of the elbow, wrist, and fingers. Compound fractures of the humerus should be treated with the arm in abduction. Shortening of the arm is of minor importance and the use of bone grafts for gap filling is seldom successful. The best results in bone grafting are obtained in the radius, the ulna, and the tibia. The author describes the Hey-Groves operation which he believes is the best for cases of non-union in association with a gap.

In cases of malunion operation should not be performed in the presence of a sinus or until some months after it has closed. Jones does not operate unless the alignment is poor and the shortening exceeds $1\frac{1}{2}$ in. When, with good alignment, there is marked rotation, he does an osteotomy some distance from the fracture.

In the joints the restoration of function by manipulation should be done with great care. If pain occurring after manipulation is of short duration, the movements may be continued, but if it persists for lengthy periods, rest is indicated. If the increased range of movement is maintained after manipulation further movements may be prescribed safely. If in spite of movements and the absence of great pain the range continually diminishes, rest is indicated. The duration of the pain when the tissues are relaxed rather than its intensity should be our clinical guide.

Flail joints frequently resulted from excision performed at casualty clearing stations or base hospitals. The so-called "limited resection" has given the best functional results. In order to preserve function the extent of the incision should be as strictly limited as is compatible with safety, the extension applied should be very moderate and of short duration, and in the after-treatment ankylosis should be sought rather than mobility.

The treatment of flail joints may consist of: (1) the removal of necrotic bone and scar tissue; (2) correct posture; (3) operative attempts to obtain improved pseudarthrosis; (4) the production of ankylosis; and (5) retention in mechanical apparatus.

In regard to the surgical repair of injuries to the nerves the author advises against delaying operation too long after the injury as chronic myositis may develop and seriously impair the power of the muscle to react on the recovery of the nerve. If a nerve does not recover within a few months it should be

explored and if found caught in scar tissue it should be freed and placed between flaps of muscle. Jones is of the opinion that a covering is not necessary about the anastomosis and that the insertion of nerve grafts or of foreign material between the anastomosed ends is of very little value. End-to-end anastomosis is strongly advocated even though a two-stage operation is necessary. At the first operation the neuromata are sutured together after the extremity has been flexed or the nerve transferred in order to secure proper approximation. The nerve is gently stretched for several weeks until the extremity is completely extended. The second operation is then done. The neuromata are resected and the ends anastomosed with silk in immediate apposition. If it is impossible to effect an end-to-end anastomosis, transplantation is suggested as a substitute.

H. W. MEYERDING and A. W. ADSON.

LEGAL MEDICINE

Employer Not Liable for Negligence of Physician in Treating Employees. *Smith vs. Buckeye Cotton Oil Co. (Ark.) 212 S. W. R., p. 88.*

In the case of Smith vs. Buckeye Cotton Oil Company the question before the court was whether or not an employer is liable for the negligence of a physician provided for an injured employee.

The facts of the case were as follows:

While employed by the Buckeye Cotton Oil Company Smith operated an engine and while so doing his fingers were caught and crushed in the machinery. He was then directed to go to the physician employed by the company to treat its injured employees. The physician treated his injuries so carelessly that amputation of the fingers became necessary. Smith sued the company on the ground that it was liable for negligence of its physician as it directed Smith to consult him. The lower court held, however, that the company was not liable and entered judgment for the company. From this judgment Smith appealed.

In reviewing the case the upper court held that when an employer owes his employee the duty of furnishing medical attention or undertakes to discharge that duty he does not become liable for the physician's negligence or lack of skill. He is liable only when he fails to exercise ordinary care in selecting a physician of requisite skill and learning. The judgment of the lower court was affirmed.

J. A. CASTAGNINO.

Evidence and Timeliness in Action of Malpractice. *Perkins vs. Trueblood. (Calif.) 181 Pac. R., p. 642.*

In this case was considered the question as to the evidence necessary for a judgment of malpractice and the time limit in which an action for malpractice may be brought.

The facts were as follows: Perkins broke his leg in March, 1912, and employed Trueblood, a physician, to set the fracture. As the fracture did not heal satisfactorily, the physician again set the leg in

April. Perkins charged that the second operation was done negligently and the lower court found in his favor.

The physician appealed on the ground that no evidence was introduced to show lack of skill or negligence and also on the ground that the action was barred by the statute of limitations. As to the latter plea, the upper court held that a malpractice case instituted within one year of the alleged negligent treatment but over a year after the physician's treatment had been begun is not barred by the statute prescribing a one year limitation in such cases.

The court rested Perkins' cause of action on the negligent resetting of the leg, and although evidence of former treatment was admissible and necessary to determine whether the methods of the physician in resetting the leg were such as an ordinarily skillful surgeon would have given the leg, the necessity of the introduction of such evidence of former treatment did not bar the action.

With regard to the first ground of appeal, the upper court held that there was not sufficient evidence of negligence in resetting the leg. The evidence presented failed to show any lack of care or skill on the part of the defendant and on this ground the judgment was reversed.
J. A. CASTAGNINO.

Recovery Allowed for Professional Service. *Brooks vs. Aldrich et al. (R.I.) 107 Atl. R., p. 100.*

The plaintiff, Dr. Brooks, sued the executor of the estate of a deceased patient for personal services rendered the deceased from Sept. 1, 1909, to April 20, 1915, and for expenses incurred in going to Europe to visit him. A judgment was entered in the lower court in favor of the physician for \$4,000. This judgment was appealed by the executor on the ground that the lower court erred in allowing the physician to qualify himself as an expert witness and to testify in his own behalf as to the nature of the services rendered the deceased and the reasonableness of the charges made by him for such services.

The upper court held that a physician can qualify as an expert witness in a case in which he is a plaintiff and affirmed the judgment of the lower court.
J. A. CASTAGNINO.

Defendant's Right to Examination of Plaintiff's Injuries Discretionary with Trial Court.
Titus vs. City of Montesano (Wash.), 181 Pac. R., p. 43.

The question before the court was whether or not the statute providing that the court may order a physical examination of the plaintiff in a personal injury action was discretionary or mandatory with the court.

The facts of the case were as follows:

The plaintiff was injured by a fall upon a defective sidewalk and filed a claim for damages with the City of Montesano which claim was ignored by the city. Plaintiff then sued the city for damages and the city made a motion asking that the plaintiff file a more specific declaration setting forth the nature of the injuries sustained and stating whether or not the said injuries were permanent. The city asked also that the court order the plaintiff to submit to a physical examination in order to determine the extent of her injuries and to qualify a physician to testify as to those injuries.

To support its demand for an examination the city quoted the section of the statute which provides that on or before the trial of any action brought to recover damages for injury to the person, the court may, on application of the parties therein, order and decree an examination of the person injured as to the injury complained of, by a competent physician in order to qualify the person or persons making the examination to testify as to the extent, nature, and probable duration of the injury of which complaint is made.

The lower court denied the motion of the city for an examination and a judgment was entered against the city for \$975.00. This was appealed by the city on the ground that the lower court erred in refusing to enter an order directing the plaintiff to submit to an examination.

The upper court in construing the statute held that the power vested in the court was discretionary and not mandatory. The court further held that there was nothing in the evidence of the case to show that the court ought to enter an order for examination and the court did not err in denying the motion for an examination. The judgment of the lower court was affirmed.
J. A. CASTAGNINO

GYNECOLOGY

UTERUS

Molinari, J. F.: Bazterrica's Procedure for Total and Subtotal Abdominal Hysterectomy (Procedimiento Bazterrica para la histerectomia abdominal total o subtotal). *Rev. argent. de obst. y ginec.*, 1919, iii, 349.

To insure good hæmostasis in utero-adnexal extirpation it is necessary to ligate three very important vascular pedicles on each side. In a hysterectomy, therefore, these three pedicles should be well exposed in order that they may be ligated easily and securely. The author describes Bazterrica's operation which is almost bloodless because of the ease with which the vessels can be tied off.

The Bazterrica operation has been used successfully by both Bazterrica and Molinari since 1891 on the different varieties of fibromata. By this procedure the opening into the uterine cavity is made last and the cavity is therefore in contact with the perineum and the operator's hands for the least possible length of time.

Molinari gives preference to conservative surgery, whenever possible enucleating the tumors. When enucleation is impossible and one or both ovaries are normal, he modifies the operation so that the first ligature lies between the uterus and the ovary. The ovary with its normal connections is left undisturbed and later is included between the folds of the broad ligament or fixed to the stump.

Six excellent colored plates showing the different steps of the operation described illustrate the article.

M. M. MATTHIES.

Botín, F.: Roentgenotherapy for Uterine Myomata (Radioterapia en los miomas uterinos). *Rev. españ. de cirug.*, 1919, I, 531.

Botín draws the following general conclusions concerning the treatment of myomatous tumors of the uterus:

1. The types of fibromyomata of the uterus for which X-ray treatment is indicated are: (1) the solitary, (2) the interstitial, (3) the subserous implanted by a broad base, (4) those of rapid development, (5) those of soft consistency, (6) those which occur in women near the menopause, and (7) those of small size.

2. The treatment of genital tumors by the X-ray is safe even when the patient is less than 35 years of age.

3. X-ray treatment may be given to patients who are anæmic from hæmorrhage provided it is not given as a preliminary to operation.

4. The following types of tumors demand operation: (1) multiple subserous fibromata, (2) pedunculated fibromata, (3) submucous fibromata, (4)

tumors which, by compression, cause serious complications, (5) tumors which produce incarceration of the bladder and repeated retention of urine, (6) tumors which extend beyond the umbilicus, (7) tumors which have undergone torsion of the pedicle, and (8) degenerated myomata.

Several illustrative case histories are given.

M. M. MATTHIES.

Vital Aza: Considerations Regarding the Operative Treatment of the Prolapsed Uterus (Algunas consideraciones sobre el tratamiento operatorio del prolapso uterino). *Med. Ibera*, 1920, iii, 1.

In the treatment of uterine prolapse in virgins and nulliparæ the author prefers the hysteropexy of Bumm. As in the cases of women between 20 and 35, the active sexual period, no operative procedure should be used which might lead to sterilization, the Schauta-Wertheim operation, ventrofixation, and the operation of Landau are contra-indicated. In operations for prolapse in patients of this age the steps to be followed are as follows: (1) extirpation of the hypertrophied parts of the genitals usually by anterior colporrhaphy and often trachelorrhaphy; (2) reconstruction of the perineal floor by colpoperineorrhaphy; and (3) fixation of the uterus in the normal anteposition by the most suitable method, usually the Alexander-Adams operation. The integrity of the perineal floor for future childbirth is preserved by a deep episiotomy and suture.

In cases of prolapse in women past the active sexual period the Wertheim modification of the Schauta operation, called also the vesicovaginal interposition operation, is the operation of choice. By this procedure the uterus is converted into a natural pessary and at the same time it serves to close the vaginal cavity. A rare difficulty encountered is hæmorrhage from the uterine wall at the points of suture which sometimes results in the formation of a hæmatoma behind the vaginal walls. In one case the hæmorrhage was so rebellious that vaginal hysterectomy was necessary.

W. R. MEEKER.

Culbertson, C.: Ligament Shortening in the Treatment of Retroflexion of the Uterus. *Surg. Clin. Chicago*, 1920, iv, 179.

Culbertson gives the history of a woman, the mother of 4 children, who at the age of 34 came to the hospital complaining of menorrhagia, metrorrhagia, backache, etc. Examination showed that she had a retroflexed boggy uterus, prolapsed appendages, and some thickening of both broad ligaments which, because of symptoms and associated conditions, was thought to be due to varicose

veins. The general physical examination was negative. The leucocyte count was 5,700 and the hæmoglobin 85 per cent. The urine was negative.

The treatment given consisted of dilatation and curettage, low amputation of an eroded cervix, a Webster round-ligament operation, lateral shortening of the uterosacral ligaments, and appendectomy. The technique of the Webster round-ligament operation is given in detail with four drawings illustrating the important points.

This operation has been employed successfully for approximately eighteen years at the Presbyterian Hospital. Its use should be limited to a uterus that is relatively normal in size and free from pathology, and to the years of child-bearing activity. It is not to be recommended when the outer portions of the round ligaments are noticeably thin, when the uterus is unusually heavy as in marked subinvolution, extreme fibrosis, or chronic endometritis, or when there are uterine fibroids or other neoplastic growths.

The patient is advised that pregnancy should not take place for ten or twelve months after the operation and in some instances, especially when the perineum is relaxed, the use of a pessary for two or three months is beneficial. Pregnancy following the operation at any time after one year progresses quite normally and labor is in no way affected. There may be an occasional relapse after pregnancy, but this may occur even in the absence of pregnancy.

The author reports also a case in which he performed the operation described on a woman 38 years of age. This patient had been married sixteen years and her only pregnancy, which occurred the first year after marriage, had terminated in a spontaneous abortion. Five months after the operation she had another abortion. By the time she was 45 years of age, however, she had had three full-term labors, all of which were spontaneous. She is now passing through the menopause and the uterus is in very good position.

C. H. DAVIS.

Recasens: The Technique of Applying Radium in the Various Types of Cancer of the Cervix of the Uterus (Variations dans la technique des applications du radium dans les différentes formes du cancer cervical de l'utérus). *Arch. mens. d'obst. et de gynec.*, 1919, viii, 676.

Recasens reports nearly 400 cases of cancer of the uterine cervix treated with radium which he has observed since 1913. From these cases, which he has followed for six years, he draws the following conclusions:

1. In cancer of the uterine cervix the treatment of choice is non-surgical. Radium therapy gives results superior to those obtained by any other means.

2. Cervical cancers in which the activity of the epithelial cells is strongest are those which yield to radium treatment best.

3. Dosage and filtration are of the utmost importance in the treatment of cancers of the uterine cervix with radium.

4. For cancers of the excrescent or papillary form active radiation is best. In such cases filtration may be reduced to 1 mm. and even less if the tube is placed in such a position that it is completely surrounded by the cancer.

5. Ulcerous forms require stronger filtration and larger dosage.

6. In superficial uterine cancers which extend to the vagina, and in all laminated forms of cancer, plates similar to those used for skin cancers should be used rather than tubes.

7. Infiltrating and nodular types of cancer require very strong filtration and very large doses of radium.

8. Very marked hypoleukæmia is a contra-indication to radium treatment. Even when the condition is slight, the dosage must be reduced.

9. Advanced cachexia is an absolute contra-indication to radium therapy.

10. Medium doses of radium repeated every eight or ten days are tolerated better than stronger doses at greater intervals.

11. Radium therapy should always be associated with roentgen therapy in the treatment of cancer of the uterine cervix.

A large number of inoperable cases treated by Recasens may be considered cured since they have not shown any signs of recurrence in from three to five years. About 30 or 40 per cent of the patients treated are not benefited.

W. A. BRENNAN.

EXTERNAL GENITALIA

Goodman, H.: Ulcerating Granuloma of the Pudenda: a Review of the Literature with a Bibliography and Some Observations of the Disease as Seen in Porto Rico. *Arch. Dermal. & Syph.*, 1920, n. s. i, 151.

The author describes ulcerating granuloma of the pudenda as an infectious, chronic, indurated cicatrizing growth on or near the genitals of either male or female, with no tendency to glandular involvement or serious impairment of the general health. He reports four cases diagnosed clinically in Porto Rico. In three of these calimato bacterium granulomatis was demonstrated, and in the fourth the spirochætal organism described by Wise (spirochæta aboriginalis). The question is raised as to whether there might not be two diseases bearing the same name which are so similar as to defy clinical differentiation.

The condition is not syphilis although it may be associated with luetic lesions or observed in a Wassermann-positive syphilitic who is free from manifestations of syphilis. Salvarsan and mercury are ineffectual in its treatment and the only drugs which appear to be of value are antimony and potassium tartrate. Local applications and irrigations of a 1:1,000 solution of potassium permanganate have resulted in temporary benefit. By the Brazilians a 1:100 solution of tartar emetic injected intravenously or given by mouth has been accorded first place in the treatment of the disease.

Clinically the lesion appears as a light red, shiny mass of granulation tissue which bleeds easily. The masses are of various sizes, exude a thin light sanguinous fluid, and have a foetid odor. The granulations are largest at the margins, the centers appearing sunken. In some cases the secretion is so profuse that it forms drops, while in others it is so scanty that the granulation masses are covered with drying scabs. Occasionally healing occurs in spots, leaving firm, raised, hairless cicatricial tissue with a thin epidermal integument. These cicatrices lie like islands in the mass of granulations. As a result of cicatricial contraction, the contiguous skin may be drawn away.

The draining lymph nodes show no enlargement, but the lymph channels may become occluded and as a result a pseudo-elephantiasis may develop. There are no metastases. The growth may invade the urethra, the rectum, or the vagina and produce impassable strictures or rectovaginal fistulæ.

Two of the author's cases were studied histologically and in each the findings agreed with Galloway's description of the disease. The main mass of the exudation lies in the upper layer of the cutis and in the papillæ and as it increases the papillæ enlarge and the interpapillary processes of the epidermis become elongated. The connective tissue of the corium disappears and its place is taken by the new infiltration of round cells so that the dense masses of the new growth underlie the elongated interpapillary processes of epithelium. The elastic fibers in the corium become broken up and distorted and finally disappear in the areas of actual infiltration. At no point in the process of granulation is there a tendency to caseation or suppuration. In the older areas bands of connective tissue begin to take the place of granulation cells. These bands increase in extent until, with shrinkage of the tumor, a firm scar tissue is formed. CAREY CULBERTSON.

Driscoll, T. L.: *Erosive Vulvitis.* *Arch. Dermat. & Syph.*, 1920, n.s. i, 170.

The author calls attention to the fact that while erosive and gangrenous balanitis has been recognized for several years, the same disease occurring in women—erosive and gangrenous vulvitis—has not been noted. He reports three cases of this disease, from each of which he isolated the typical spirochæte and vibrio growing in symbiosis as described by Tunncliffe. The spirochæte varies from 5 to 30 microns in length, has very rapid motion, is gram-negative, and takes the ordinary dyes well. The vibrio or fusiform bacillus is 2 microns in length, 0.8 micron in width, and pointed at each end. It grows singly or in chains, is gram-positive when carefully decolorized, and takes the ordinary aniline dyes.

The factors predisposing to the condition seem to be filth and prostitution. In all three cases reported there was a large amount of discharge from the infected areas as well as from the vagina. In each instance there was extensive ulceration of the parts

with some local œdema. In two cases there was inflammatory involvement of Bartholin's gland, and in the third, a history of such involvement previously. In all, extensive ulcerations extended from the clitoris to the anus and buttocks and there was more or less sloughing of the labia minora and majora. In the third case the vulva and both Bartholin glands had been almost entirely destroyed.

The lesion is erosive. The edges are turned outward and rise above the ulcer itself. A grayish-yellow pus with the same foul odor as that of erosive and gangrenous balanitis bathes the ulceration. The lesion is dark red and quite similar to the ordinary varicose ulcer of the leg. In the cases reported the inguinal lymph glands were hard, nodular, and moderately enlarged, but without suppuration. No systemic changes of pathologic significance were noted. The Wassermann reaction was negative. CAREY CULBERTSON.

MISCELLANEOUS

Wilson, T. G.: *Remarks on the Results and Treatment of Yielding of the Suspensory Apparatus of the Female Pelvic Organs.* *Med. J. Australia*, 1920, i, 2.

Wilson gives a very thorough classification of the various forms or types of prolapsus uteri. He first divides the genital canal into three portions, viz., (1) the upper portion, the uterine body; (2) the middle portion, the cervix and upper part of the vagina; (3) the lower portion, the lower two-thirds of the vagina. Each of these portions has its own supporting elements and each is more or less dependent on the other two portions for the maintenance of its normal position. Therefore, if there is yielding of one group of supports more strain is thrown on the other two groups. If this strain continues there is yielding in all three groups and complete prolapse of the uterus results. The proper recognition of the group of supports at fault determines the proper procedure for its restoration and unless the type of uterine prolapse is differentiated it cannot be treated successfully.

In uterine prolapse due to yielding of the upper group of supports which causes displacements and may or may not give rise to symptoms, palliative measures, especially the use of the pessary, are sufficient in most cases.

When there is yielding of the middle supporting group, which allows the cervix and upper part of the vagina to sag and leads to inversion of the vagina from above downward, operation is necessary. In this connection the author discusses the numerous operations devised for the cure of prolapse. He has not invented a new one, but makes certain recommendations which he believes are worth while.

In cases of prolapse due to yielding of the lower supporting group following actual laceration or overstretching and leading to eversion of the vagina, cystocele, and rectocele, the usual operations are recommended. H. B. MATTHEWS.

Goldberg, S.: The Futility of Intraligamentary Shortening of the Round Ligaments When Operating for Other Intrapelvic Conditions. *N. York M. J.*, 1920, cxi, 197.

The author denies that the round ligaments are "guy-ropes" and that the mere abnormal position of the uterus is the cause of symptoms. The symptoms are due to the complications.

In retroposition of the uterus the round ligaments are never overstretched and therefore do not require shortening. When the uterus is released from its retro-incarceration, it will maintain its normal position by virtue of the normal resiliency of the non-striated muscle of the round ligaments. All operations which fasten the uterus after it is released only put it into another abnormal position.

M. J. GELPI.

Mahle, A. E., and MacCarty, W. C.: Ectopic Adenomyoma of Uterine Type; A Report of Ten Cases. *J. Lab. & Clin. Med.*, 1920, v, 218.

The authors report 10 ectopic adenomyomata located as follows: 1 in the umbilicus, 2 in the abdominal wall, 1 in the sigmoid, 2 in the groin, and 4 in the rectovaginal septum. These tumors were extra-uterine, extratubal, and diagnosed at the time of operation as adenomyomata. They contained glandular portions resembling typical uterine mucosa, surrounded by a fibrous connective tissue and smooth muscle stroma in varying amounts.

In the case of adenomyoma of the umbilicus the tumor was of four years' duration and had no connection with the peritoneum or any abdominal tissues. Both of the patients with adenomyoma of the abdominal wall had had an operation performed previously. One of these previous operations was a shortening of the round ligaments and the other a ventral suspension. In neither case was it possible to trace any connection between the adenomyoma and the endometrium. In one case the tumor was adherent to the tube and in the authors' opinion it arose from a similar tumor in the tube. In the other case the tumor was attached to the uterus, but its

pathologic relationship could not be microscopically demonstrated and it could not be determined definitely that it arose from the endometrium.

In the case of adenomyoma of the sigmoid, the tumor was not removed and only the anatomical relationship between the adenomyoma and the uterus was established. From this and a similar case reported in the literature it would appear that the adenomatous tissue invaded the sigmoid from the uterus and that the growths infiltrated from the outer bowel wall. In the cases in which the tumors were situated in the groin, the tumors were not related to the round ligament but were lateral to it. At operation no relationship could be established either to the round ligament or to any other structure closely related to the uterus.

Of the patients with adenomyomata of the rectovaginal septum, only one had symptoms traceable to the tumor, pain in the rectum at the time of menstruation and difficulty in defecation. In the other cases the growths were found in the course of routine examination. The tumors varied from 0.5 to 3 cm. in diameter.

Pathologically, extra-uterine adenomyomata are identical in appearance wherever they are found. They differ grossly from adenomyomata of the uterus in that the cystic areas are larger and their contents darker. Clinically they give no consistent group of symptoms on which an accurate diagnosis may be based. Their slow growth and their location suggest that they are benign tumors. Surgically, despite their remarkable infiltrative power, adenomyomata should be distinguished from malignant growths. They may be recognized grossly in most cases by the fibrous stroma which contains cystic areas filled with bloody, dark brown, or serous fluid. Microscopically a regularity of gland structure is found with normally differentiated epithelial cells without mitosis. The tumors do not form metastases, and pregnancy does not appear to influence their occurrence. At present all that is known of the origin of ectopic adenomyomata of uterine type is theoretical.

G. S. FOULDS.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Jackson, C. E. S.: Acute Intestinal Obstruction Due to Pregnancy in a Bicornate Uterus. *Brit. M. J.*, 1920, 1, 185.

Jackson's patient was between two and three months pregnant when she was seized with sudden, severe pain in the abdomen and vomiting associated with distention. Treatment by turpentine enemata was in vain and after forty-eight hours of suffering she was brought to the hospital. There was no faecal vomiting, but otherwise the symptoms suggested intestinal obstruction. Physical examination showed the uterine fundus above the umbilicus. On rectal palpation a mass was discovered which filled the whole pelvis and pressed against the rectum. A diagnosis of pregnancy complicated by impaction of an ovarian cyst was made.

At operation the mass was discovered to be one horn of a bicornate uterus attached to the left side of the cervix which lay behind the broad ligament and had no connection with the left fallopian tube. This horn was opened and a two or three months foetus was removed. Convalescence was uneventful.

Jackson raises the question as to whether or not the abnormal horn should be removed. In his opinion it should be. He believes that such a procedure would be safe and simple and would prevent a possible recurrence of the trouble at a future pregnancy.

O. C. MELSON.

Mathieu, P.: Intestinal Occlusion in a Woman Eight Months Pregnant; Caesarean Section and the Formation of a Secondary Caecal Fistula; Recovery (Occlusion intestinale chez une femme enceinte de 8 mois et fistulisation secondaire du caecum. Guérison). *Bull. et mém. Soc. de chir. de Par.*, 1919, xlv, 1545.

A woman 35 years of age, who had been pregnant for eight months, was caught between a street car and a wagon and received an injury of the abdomen. She did not lose consciousness. The following day an internal hæmorrhage occurred and the abdomen became enlarged. A diagnosis of foetal death, placenta prævia, and intestinal occlusion was made and the patient sent to the hospital. On her admission her general condition was good but there were symptoms of a forty-eight hour occlusion and on careful examination and palpation placenta prævia was evident. No foetal movements or heart sounds could be distinguished. Labor had not begun.

Mathieu concluded that the occlusion was due to a paralytic ileus of obscure nervous origin and that emptying of the uterus would overcome it. He therefore performed a caesarean section. The foetal sac was intact. Exploration disclosed distention of the entire

large intestine without mechanical obstruction. The following day a caecal fistula was made to allow the escape of flatus as the meteorism persisted. This resulted in rapid disappearance of the meteorism and within a few days faeces were passed normally. The fistula closed spontaneously and the patient made an excellent recovery.

As a rule the prognosis of intestinal occlusion in the course of pregnancy is very unfavorable. Thirty of 47 cases collected from the literature by Gauchery in 1903 had a fatal termination.

W. A. BRENNAN.

Spencer, H. R.: The Lettsomian Lectures on Tumors Complicating Pregnancy, Labor, and the Puerperium. *Brit. M. J.*, 1920, 1, 179.

Fifty-five ovariectomies performed for ovarian tumors are reviewed, consideration being given to the types of the tumors, the abortions resulting from operation, the complications, and the end-results of treatment. Nine of the patients were nulliparæ at the time the tumor was present. The average number of children born before operation per patient was 3. In 48 cases there were 33 abortions in 125 pregnancies. In 5 cases the abortion occurred before operation. In the 15 cases in which operation was performed during the pregnancy there were 4 abortions. Two of these patients had bilateral tumors; 1, hæmorrhage with mole; and 1, torsion of the pedicle of the tumor.

The tumor was a cystadenoma in 33 cases (60 per cent); a dermoid in 15 (27.2 per cent); an ovarian fibroid in 3 (5.4 per cent), and a parovarian tumor in 6 (10.9 per cent). Torsion occurred in 12 of the first type, in 5 of the second, and in 1 of the third. It therefore was found in a total of 17 tumors (32.7 per cent).

The cystadenomatous tumors were large. Twenty-two were multilocular and 11 unilocular. All of the dermoids were small except 3. Twenty per cent were bilateral. The ovarian fibroids were large and in 1 case bilateral. The parovarian tumors were all small except 1 which contained 10 pt. of fluid.

Rupture of the cyst occurred in 3 cases (in 1, during labor). Suppuration of the cyst was found in 8 cases and in all of these following delivery. The cystadenomata showed suppuration in 6 of the 8 cases. Of the dermoids, suppuration occurred in 1 after tapping.

The right ovary was involved in 23 cases, the left in 18, and both in 8. Four parovarian tumors were on the right side and 1 on the left. Pelvic incarceration occurred in 5 cases. In 1 case the tumor was taken for a uterine fibroid and a caesarean section was performed. The other 4 were delivered

by reposition or abdominal operation for ovarian tumor. In the author's opinion reposition should be attempted with the patient in the Trendelenburg position and under anesthesia before resort is had to abdominal section. If it is impossible to push the tumor up, the uterus should be withdrawn from the abdomen. The procedure indicated is to remove the tumor and, if the child's condition is good, effect delivery with the forceps. If the child is not in good condition, it should be delivered by forceps as soon as the tumor is pulled out of the uterus. The use of the forceps to deliver the child (by a second operator if possible) after pre-operative dilatation of the cervix is the method of choice even when the uterus is outside of the abdomen.

With the exception of 2 cases, the tumors did not grow rapidly during pregnancy. In the puerperium, however, the growth seemed to become more rapid.

In the 55 ovariectomies there was 1 death. In the 15 cases in which the operation was performed during pregnancy, 12 of the patients were operated upon during the first half of the gestation; 2, during labor; and 1 after section at term. In 2 cases labor was induced on account of a contracted pelvis. All of the mothers recovered. Eleven children were born alive and there were 4 abortions. One child died soon after birth. Therefore in the 15 cases the child was lost in 5.

The operation was done through a midline incision except in 2 cases in which the Pfannenstiel was employed. The importance of carefully ligating the ovarian artery with an isolated ligature is emphasized. Of the 40 patients not operated upon during pregnancy all recovered. The fetal mortality was 21.6 per cent.

Pregnancy did not appear to favor malignancy as none of the 55 cases was malignant. Of the ovarian tumors not associated with pregnancy 20 per cent are malignant. In women over 70 malignant ovarian tumors are rare.

A brief review of the symptoms leads the author to the conclusion that because of the lack of subjective symptoms in cases of uncomplicated tumors a routine examination should be made during pregnancy.

The diagnosis of pregnancy complicated with ovarian tumor is usually not difficult. In examining the uterus for Hegar's sign the danger of separating the ovum by too much manipulation must be borne in mind. Care should be taken in differentiating a soft cervix with easy separation of the body of the uterus from an ovarian tumor. The possibility that the uterus is a lop-sided pregnant uterus must be considered when a tubal pregnancy is suspected. In doubtful cases rectal examinations and examinations under ether are of aid.

The treatment is taken up in some detail. During the first half of pregnancy ovarian tumors should usually be removed whatever their situation or size. Four exceptions are lutein cysts complicating hydatiform moles, bilateral symptomless tumors, primary malignancy, and secondary malignancy.

During the second half of pregnancy all large, ruptured, inflamed, and strangulated tumors should be removed. Small tumors should be watched and when replacement from the pelvis is not possible should be removed during labor or at the end of pregnancy. If adherent or solid, section is indicated. All vessels of the pedicle should be ligated separately and as far as possible from the uterus. During labor the best treatment is the immediate removal of the ovarian tumor, at the end of the first stage if it is large, and after the delivery if it is small. The abdominal route is the best for the removal of such tumors. Premature induction of labor, version, the use of forceps, and tapping of the cyst are contra-indicated as a means to overcome dystocia from obstruction. During the puerperium ovarian tumors should be removed when possible within twenty-four hours of delivery. If sepsis is suspected, however, delay is advisable unless strangulation or tumor infection arises.

In general the treatment must be modified in pregnancy in order to maintain fertility. Attention is drawn to the fact that in the cases treated by operation the fetal mortality was 33 per cent, while in those not treated by operation it was only 21.6 per cent although some of the latter were handled unskillfully. Abortion figures also were correspondingly higher in the cases in which operation was performed.

Bilateral tumors should be treated conservatively, especially when the patient has not borne children.

W. N. ROWLEY.

Davis, C. H.: Tuberculosis with Pregnancy. *Wisconsin M. J.*, 1920, xviii, 355.

On the basis of the mortality report of the United States it is estimated that in 1915, 43,666 women between the ages of 15 and 45 died from tuberculosis and 15,103 from childbirth. It may be assumed that a small percentage of those who died from childbirth had tuberculosis and that pregnancy or childbirth was a contributory cause of many deaths recorded as due to tuberculosis.

Tuberculous pregnant women are found in every community. Most of them are cared for by physicians in general practice rather than in institutions where they would be kept under careful observation and the end-results reported for the information and guidance of the medical profession. Bacon has estimated that between 24,000 and 36,000 tuberculous women are confined in the United States each year and from the meager statistics available he concludes that about 33 per cent of the tuberculous women who become pregnant will die within a year after delivery.

In any attempt to attack the problem of tuberculosis and pregnancy the women must be divided into two classes: (1) women who are known to be tuberculous before they become pregnant, and (2) women who are found to be tuberculous during a pregnancy. Obviously most may be accomplished by educating the first group.

Tuberculosis is a contra-indication to marriage only secondary in importance to gonorrhœa and syphilis. Women with a history of tuberculosis should not marry until some years after all active signs of the disease have subsided. Before marriage such women should be instructed regarding the danger of a recurrence during pregnancy. They should be made to appreciate also the importance of receiving the maximum of rest, fresh air, good food, and expert medical supervision during the entire period of pregnancy and for several months thereafter.

The woman who develops tuberculosis after marriage should be instructed regarding the ordinary mechanical means of avoiding conception. It is useless to advocate long-continued abstinence. If she becomes pregnant in spite of advice, she should have sanatorium care as few women will secure the needed rest, fresh air, and proper diet at home. Usually a healthy child may be expected but it should be removed from the mother at birth. Nursing is rarely, if ever, advisable in these cases as it greatly lessens the prognosis for the mother and exposes the child to practically certain contact infection.

Cornell, E. L.: The Kroenig Cæsarean Section.
Surg. Clin. Chicago, 1920, iv, 195.

The attitude of the profession toward cæsarean section has changed in the last twenty years and the operation is now being done more frequently. When it is performed by specialists the results are very good, but whether those obtained by the general profession are as good is open to question. The maternal deaths are usually due to gross neglect of indications, sepsis, ignorance, or failure to make examinations previous to labor. Several cases are reported.

The classical cæsarean section is contra-indicated in women who have had repeated vaginal examinations under septic conditions or intra-uterine manipulations.

The Kroenig cæsarean section is useful in neglected cases and in selected cases which have not been mismanaged. In general, it is employed on patients who have been in labor for a few hours as the lower uterine segment is then formed. If possible, the patient is prepared for operation some days in advance and no drastic catharsis is given. The vulva and abdomen are shaved and a soap-suds enema is given. Just previous to the operation the abdomen is prepared by a nurse who washes it first with cotton pledgets soaked in green soap and water, and then with a 1:1000 bichloride solution and $\frac{1}{2}$ per cent lysol. The patient is catheterized just before operation and the catheter is left *in situ*.

After anæsthesia has been obtained the patient is placed in the Trendelenburg position. The incision is made from the umbilicus to the symphysis pubis in the median line. The fascia is split about $\frac{1}{4}$ in. to the left of the linea alba and the rectus muscle is retracted to the left. The incision is then carried

through the peritoneum. Care must be taken to avoid injuring the peritoneum lying over the uterus. The abdominal walls are retracted and the peritoneum over the lower uterine segment is grasped with tissue forceps about $\frac{1}{2}$ in. above the juncture of the bladder with the uterus. Here a transverse incision about 10 cm. long is made and the loose peritoneum is dissected upward with the finger. This dissection is carried out in a semicircular fashion and is followed by dissection of the peritoneum below, including the bladder which is separated low down toward the vagina.

The bladder is retracted against the pubis. Care is taken by the assistant to avoid too much traction as the bladder may be injured by pressure between the retractor and the symphysis pubis. A somewhat elliptical opening through the peritoneum now remains and the lower uterine segment is exposed.

The next incision is made parallel to the longitudinal axis and in the center of the uterus. The incision through the lower uterine segment is begun from below to avoid covering the line of incision with blood. Care is used in incising the uterus in order to avoid cutting the baby's head which lies close beneath the cervix. If the line of incision is covered with blood and the view is obstructed, the incision is carried through the segment to its upper portion and the opening is enlarged downward with blunt scissors, the way being felt with the fingers. This prevents any injury to the foetal head, the bladder, or the urethra. The incision in the uterus is made from 10 to 12 cm. in length.

After the membranes are ruptured the finger is placed in the baby's mouth and the face is rotated anteriorly. Forceps are applied quickly and the head is delivered by flexion, the rest of the child following without any particular mechanism. In delivering the head, the principles of normal delivery are followed, the upper end of the uterine incision being used as is the symphysis pubis in a normal cephalic case. The child is now grasped by the feet, the mucus cleaned from the nose and throat, and the cord cut between two clamps. If possible the tracheal catheter is used by an assistant as this relieves the operator and does not distract his attention from the mother.

After delivery, the upper and lower ends of the uterine incision are grasped with volsellum or Allis forceps and the uterus is pulled gently up on a line with the abdominal wound. This keeps the blood from entering the abdominal cavity and also prevents contamination when the placenta and membranes are delivered. The assistant then injects pituitrin directly into the uterine muscle in two different places. Usually a good uterine contraction results in a very few minutes. There is no hurry in removing the placenta. It is easily separated when it is not near the incision and is frequently expelled spontaneously through the uterine incision. If this does not occur, it is gently shelled out of the uterus. Great care is used in dealing with the membranes. All of them are removed in order to avoid

saprophytic infection. Often it is possible to expel the placenta by means of pressure on the fundus through the abdominal wall.

After the placenta is expelled the uterine cavity is examined and all clots are removed. The cervix is examined and if it is not dilated, dilatation is attempted from above until it admits two fingers. In removing the hand, care is taken that the fingers are not wiped over the cervical or abdominal wound.

The gloved hands are now washed in pure lysol or, in cases of suspected vaginal discharge, another sterile pair of gloves is put on. The uterine wound is then sewed with two layers of No. 2 twenty-day chromic catgut. Great care is taken to sew the extreme ends of the incision. The time spent on this work is not wasted as seepage between the uterus and peritoneum can be prevented and the risk of infection is decreased. After the uterus is sewed the upper peritoneum is replaced and stitched. The bladder is brought up and fastened over the upper edge of the loosened peritoneum so that no portion of the uterine wound is exposed.

The abdominal toilet is now completed unless it is essential to sterilize the patient. In a clean case this is permissible.

As the operation is done to prevent infection it is unwise to make any other abdominal examination, and especially to massage the uterus within the abdomen.

The mortality so far as the mothers are concerned has been nil. The morbidity is not as high as in cases treated by high forceps, craniotomy, etc. The number of babies lost is not any larger than when other methods are used. The uterus does not become adherent to the abdominal wall. The scar is so placed that rupture is less apt to occur in subsequent pregnancies. EDWARD L. CORNELL.

González, T. J.: Vaginal Cæsarean Section in the Treatment of Placenta Prævia with Severe Hæmorrhage (La cesarea vaginal en el tratamiento de la placenta previa con hemorragias graves). *Semana méd.*, 1920, xxvi, 167.

About two years ago the author reported a series of cases in which rapid emptying of the uterus was indicated and cæsarean section was done. At that time he regarded the operation of Durham as preferable to abdominal cæsarean section. His experience during the past two years has strengthened this opinion, especially as regards cases in which the emptying of the uterus is indicated absolutely as in placenta prævia with severe hæmorrhage. In this paper he gives the results of a recent series of eight cases which bear out this contention. There was no maternal mortality. The single death among the babies was due only partly to the procedure and partly to the large size of the child which weighed 3.8 kilos. The fact that vaginal cæsarean section is not practiced as often as its safety and simplicity warrant is doubtless due to the fear of aggravating hæmorrhage by placing an incision close to the placental implantation. W. R. MEEKER.

LABOR AND ITS COMPLICATIONS

Cuzzi, G.: Painless Childbirth (Il parto senza dolore). *Policlín.*, Roma, 1919, xxvi, sez. chir., 385.

In 40 obstetrical cases the author used a solution containing 4 cgm. of morphine hydrochlorate and 10 cgm. of pituitary extract. This preparation was injected hypodermically. As a rule headache and nausea developed about twenty minutes after the injection, but vomiting was rare.

Of the 40 cases there was complete analgesia in 35. In the remaining 5 the labor pains were diminished and well borne. The duration of the analgesia varied from six to eight hours. The secundines were expelled normally.

In the majority of cases the vigorous condition of the child was demonstrated by crying and movements of the limbs. In a few instances, however, the child was cyanotic and its musculature was flaccid, but artificial respiration was necessary only twice and the manifest effect of the preparation was only temporary and not harmful.

The injection does not affect the duration or intensity of the uterine contractions, the duration of labor, or the course of the puerperium, and may be repeated after a suitable interval without danger.

W. A. BRENNAN.

Sklavounos, G.: Rapid Expulsion of the Placenta. *Surg., Gynec. & Obst.*, 1920, xxx, 168.

The author describes and recommends a modification of a very old method of mechanical detachment of the placenta, viz., the so-called Mojon method. Mojon first described the detachment of the placenta by the "injection of the umbilical cord" in 1826.

The author injects hot normal saline through the omphalic vein in sufficient amount to fill the veins and arteries, the quantity required averaging 250 gm. The technique of this procedure is very accurately described in the text. The increase in weight of the placenta and the subsequent overswelling of the villi tend to bring about the detachment more quickly than normal conditions.

The author strongly advocates the quick detachment of the placenta. It has many obvious advantages over the Credé method. It is less painful and less apt to cause postpartum hæmorrhage.

Although using the same route for his injection as Mojon, the author claims superiority for his method for the following reasons:

1. It conforms to the new methods of aseptic obstetrics.

2. It produces a complete filling of the vascular system of the placenta and therefore a swelling of the villi.

3. The injected hot water increases the natural hæmatoma behind the placenta.

4. The injection is made with hot hypertonic salt solution to which is added 2 per cent citrate to dissolve the clot completely.

Up to the present time 60 cases have been successfully treated by this method in the University Lying-In Hospital of Athens, Greece.

In conclusion the author claims "that this method is especially suited to the man who practices under great difficulties in the little town and village and who would hesitate to introduce his hand into the vagina when he is able to obtain the same result with a simple and safe method."

H. B. MATTHEWS.

PUERPERIUM AND ITS COMPLICATIONS

Losee, J. R.: *Blood Transfusion in Obstetrics.* *Med. Rec.*, 1920, xcvi, 265.

Since the introduction of the indirect method of transfusion Losee has performed the operation 78 times on 70 patients suffering from the complications of labor. Sixty-one of these transfusions were done by the syringe-cannula method, and 17 by the citrate method. There were 14 deaths in the series and all but one of them were due undoubtedly to the condition from which the patient was suffering. The one exception, which may or may not have been due to the transfusion, occurred before preliminary tests were made.

In 30 cases the transfusion was performed for hæmorrhage or hæmorrhage and shock; in 29, for anæmia secondary to postpartum hæmorrhage and localized pelvic sepsis; in 7, for bacteræmia, septic thrombophlebitis of the pelvic veins, or general peritonitis; and in 4, for toxæmia of pregnancy causing pernicious vomiting.

In the 30 cases of acute hæmorrhage (due to placenta prævia, premature separation of the placenta, ruptured ectopic pregnancy, or rupture of the uterus) 32 transfusions were done and 6 of the patients died. Many of the others were in exceedingly poor condition and probably would have died also in a few minutes if they had not received a large transfusion of blood.

In the 29 cases of anæmia secondary to postpartum hæmorrhage and localized pelvic sepsis 30 transfusions were done. All of these patients recovered completely although on admission to the hospital some of them seemed critically ill. In a few instances the number of red blood cells was as low as 1,200,000 and the hæmoglobin was only 20 per cent. In one case the erythrocytes numbered 500,000, the hæmoglobin was only 10 per cent, and the leucocytes numbered 31,000 with 89 per cent polymorphonuclears.

The treatment of general sepsis (bacteræmia and septic thrombophlebitis of the pelvic veins) by blood transfusion has been tried on many occasions, but even when the donor has been immunized with autogenous vaccines it has given very poor results. Aside from the fact that it acts as a supportive measure, there is no scientific basis for it as human plasma is very slightly, if at all, bactericidal. Patients with postpartum bacteræmia due to the hæmolytic streptococcus or staphylococcus aureus

are suffering from a fulminating infection and in the majority of instances succumb to the disease in from seven to ten days.

In the 4 cases of toxæmia of pregnancy with pernicious vomiting there were 2 deaths. In this condition also transfusion is only a supportive measure.

The author summarizes his paper as follows:

1. Serious hæmorrhage complicating pregnancy and labor has been successfully treated by indirect blood transfusion.

2. In anæmia secondary to postpartum hæmorrhage and pelvic sepsis transfusion is definitely indicated and gives satisfactory results, but in cases of bacteræmia and septic thrombophlebitis it has little or no effect.

3. As indirect blood transfusion is often a life-saving procedure in obstetrics, obstetrical institutions should be prepared to perform the operation instantly at any time.

C. H. DAVIS.

NEW-BORN

Thomas, T. T.: *Brachial Birth Palsy: A Pseudo-paralysis of Shoulder-Joint Origin.* *Am. J. M. Sc.*, 1920, clix, 207.

Obstetrical or brachial birth palsy represents only one phase of a much larger shoulder-joint problem. Almost all, if not all, shoulder-joint injuries are associated with a brachial paralysis, palsy, or weakness of varying degree and duration. Very rarely is an actual nerve rupture associated with the paralysis.

The best evidence of the absence of rupture of a nerve is the almost uniform and general disappearance of the paralysis.

In obstetrical paralysis there is soon after birth a profound and almost, if not entirely, complete paralysis of the whole limb rather than a paralysis limited to the small Duchenne-Erb groups of muscles.

The extravasation into the axilla of blood and synovial fluid causes immediate inflammation and later the formation of cicatricial tissue. This is probably absorbed in time and its absorption would account for the disappearance of the paralysis.

The Duchenne-Erb localization of the paralysis by electrical reactions to the deltoid, biceps, brachialis anticus, infraspinatus, and supinators of the forearm has been widely accepted, but not corroborated.

Following the investigations of Duchenne and Erb, the paralysis was generally believed to be due entirely to injury of the brachial plexus, but since 1911, when the author suggested that the shoulder-joint injury was the primary cause of the palsy, the former theory has not been accepted by all investigators.

It is very probable that in successful deliveries the traction on the head at birth has never been sufficient to rupture the brachial plexus.

H. B. MATTHEWS.

MISCELLANEOUS

Davis, C. H.: Maternal Mortality. *J. Am. M. Ass.*, 1920, lxxiv, 523.

The author examined 10,000 family records of the Northwestern Mutual Life Insurance Company. The first series of 5,000 showed that 1 applicant for life insurance in every 17 reported that the mother or sister or both had died from the immediate effects of childbirth; 1 in 27, that tuberculosis was the cause of the death; and 1 in 47, that cancer or other malignant tumor was responsible. The corresponding ratios in the second series of 5,000 applicants were: childbirth 1:17.7; tuberculosis 1:29.7, and malignancy 1:42.7. In view of the similarity of the ratios in the two series, it was not considered worth while to give more time to this line of investigation.

Mortality statistics show that for women of childbearing age (15 to 45), childbirth is the second greatest cause of death. The records of life insurance companies show that among women who are insured under 45 years of age, the diseases of pregnancy and the puerperal state are the second greatest cause of death. Childbirth ties with nephritis and Bright's disease for fourth place as a cause of death among insured women.

A study of 10,000 family histories demonstrated that the death of a mother or sister or both had been due to childbirth in 1 of every 17.3; to tuberculosis in 1 of 28.3; and to malignancy in 1 of 45. It is believed that a considerable percentage of these deaths from childbirth were recorded on the death certificates as being due to tuberculosis, heart dis-

ease, etc., but that the applicant for insurance remembered the associated childbirth and not the cause of death given on the death certificate. The present mortality records do not show the frequency of childbirth as a contributing cause of death.

Maternal mortality may be greatly reduced by the application of present-day obstetrical knowledge. Systematic education similar to that used in combating tuberculosis is needed.

Increased hospital facilities and nursing service must be provided. The state should furnish assistance in giving poor women the proper care during pregnancy, labor, and the puerperium. For the present, more hospital beds may be made available by sending women to their homes by ambulance early in the puerperium and caring for them through an out-patient nursing service.

The clinical teaching of obstetrics must be improved. Out-patient services are still necessary, but as soon as beds are available the women should be brought to the hospital for delivery. From the so-called simplified technique used in many out-patient services, students get a midwife's idea of obstetrics and these methods are reflected in the continued high maternal mortality. Few internes have an obstetrical training comparable with that received in medicine and surgery.

Churches could aid greatly in making motherhood safer if on Mother's day special collections were taken for the obstetrical services of the various hospitals. In addition to the money raised, such a collection would have an educational value in that it would call attention to the great needs of obstetrics.

EDWARD L. CORNELL.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Hyman, A.: Fused Kidney with Calculus in the Pelvis. *Internat. J. Surg.*, 1920, xxxiii, 48.

The author describes a case of fused kidney in a man 24 years of age. The patient complained for two years of pain on the left side of the abdomen radiating down toward the spine and umbilicus. The physical examination was negative. The urine at times was blood tinged. X-ray examination revealed a concretion the size of a cherry in the left lumbar region close to the iliac crest which resembled a ureteral calculus. Cystoscopy showed the bladder to be normal and the trigone and ureteral orifices normally placed.

Both ureters were catheterized without difficulty. The right kidney specimen was cloudy and contained pus and blood cells. There was no indigo-carmin return in forty minutes. The capacity of the pelvis was 12 ccm. The specimen from the left side was clear and contained no pus cells. The urea was normal and the kidney function practically normal. As a pyelogram failed to show the outline of the kidney, a roentgenogram was made after X-ray catheters were introduced. It was then found that the right ureter crossed the spinal column and came into contact with the shadow of the supposed calculus.

A diagnosis of fused kidney on the left side with a double pelvis and a stone in the lower pelvis was made. At operation the diagnosis was verified. The stone was removed through an anterior pyelotomy incision. Recovery was uneventful.

T. F. FINEGAN.

Seres, M.: Nephrolithiasis (Sobre calculosis renal). *Prog. de la clin.*, Madrid, 1919, vii, 264.

In cases of stone located in the renal pelvis and calices, characteristic changes in the form, appearance, and color of the ureteral orifices, and in the ejaculation and appearance of the urine have been observed. These changes are not as marked or as constant as those due to ureteral stone, but are of great diagnostic value.

After an attack of renal colic in which a stone has been passed cystoscopic examination shows torn margins of the orifice surrounded by a zone of ecchymosis and beyond that by an oedematous zone. When calculi are present but have not been passed the ureteral lips are enlarged and pouting. In cases of secondary infection this picture is often modified.

In calculous hydronephrosis and pyonephrosis the ejaculations of urine from the ureters may be reduced to two or three per minute and the force is greatly decreased. In some instances the ejaculation may

be prolonged, the urine dribbling from the orifices almost continuously.

In uncomplicated cases the urine is clear and mingles at once with the bladder contents. When infection is present it appears turbid and at each ejaculation the transparency of the bladder contents is lessened.

W. R. MEEKER.

Judd, E. S.: The Results of Operations for the Removal of Stones from the Ureter. *Ann. Surg.*, 1920, lxxi, 128.

Stones in the ureter may pass into the bladder spontaneously. Most of these calculi originate in the calices and pelvis of the kidney but some of them are formed in the ureter in association with ureteral stricture. In some cases stones lodged in the ureter may produce no symptoms and no changes in the ureter or kidney. In others, in addition to symptoms, they may cause marked dilatation of the ureter above them and hydronephrosis. Even when the symptoms are marked, however, the diagnosis should always be checked up by the X-ray and cystoscope with the use of the ureterograms advocated by Braasch.

If after the diagnosis is established the patient has frequent and severe attacks of pain, it is advisable to keep him under observation for a time before attempting treatment as the stone may pass spontaneously. However, the possibility that severe pressure in the ureter and kidney may result in hydronephrosis must be borne in mind. When the stone is apparently causing no symptoms, it is advisable to remove it unless there are contraindications.

The non-operative treatment of cases of ureteral stone consists in dislodging the calculus by means of a ureteral catheter or small sound. The contraindications to this procedure as given by Braasch are: (1) a stone 2 cm. or more in diameter, (2) acute ossification with continuous obstruction, (3) acute renal infection, (4) the patient's intolerance of cystoscopic manipulation, and (5) anatomical deformity. Braasch has removed ureteral stones by non-operative methods in about 126 cases and has had excellent results, especially when the stone was lodged at the ureteral orifice.

If pyelonephritis has resulted from the presence of the stone and there is evidence of general infection, it is inadvisable to remove the stone if the opposite kidney is functioning well. If the stone is situated in the lower third of the ureter and the kidney is badly damaged it is best to remove the kidney and leave the stone even though later the removal of the stone may be necessary because of pain. When the stone obstructs the ureter so that the function of the kidney on the same side cannot be ascer-

tained, it is best to remove the stone only. Conservative methods are justified in any case of chronic kidney infection while radical methods must be employed in acute, severe infections. Of the latter nephrectomy is the operation of choice, but the kidney should not be removed unless it is extensively infected as it may recover its function. In two cases cited complete anuria was caused by a stone in the ureter but neither of the patients seemed to be ill as a result of this anuria and both of them recovered completely after the removal of the stone.

In cases of bilateral calculi operation seems best, one stone being removed at a time. The author operates on the side showing evidence of acute trouble, and if there is no apparent difference, removes the stone from the ureter on the side with the least function.

While the operative removal of calculi from the ureter must be considered a major operation, it may be performed with practically no mortality and with good results.

J. A. H. MAGOUN, JR.

BLADDER, URETHRA, AND PENIS

Harris, S. H.: The Resection of Impassable Strictures of the Urethra, with a Report of Three Cases. *Med. J. Australia*, 1920, i, 99.

Harris bases his treatment of impassable stricture on the following principles: (1) "that the perineal portion of the male urethra may be slit upon its floor to any desired extent and thus converted into a "ribbon;" (2) that any damaged portion may then be resected and the ends of the "ribbon" sewn together; and (3) that provided no urinary contamination of the wound be permitted, the urethra will resume its tubular form naturally and in due course." Thus the necessity for the long-continued use of sounds after the usual external and internal urethrotomy is avoided.

To obtain a clean field for operation as well as to take care of the impairment of renal function so often concomitant with impassable stricture, a cystotomy is first performed and drainage and irrigation of the bladder are instituted for at least a week before the perineal work is done. With the patient in the exaggerated lithotomy position, a sound is then passed to the stricture from without or through the cystotomy wound. The incision is made down to the sound, and the urethra is widely exposed and converted into a "ribbon" with the strictured area in the center. The stricture is resected, the scar tissue carefully dissected out, and the ends of the urethra approximated and sutured snugly together. No further sutures are necessary as the sides of the incision fall together naturally when the thighs are brought in apposition. Suprapubic drainage is discarded in ten days and in three weeks a large sound is passed.

The author reports three cases in which this operation was followed by complete recovery.

H. W. PLAGGEMEYER.

Crenshaw, J. L.: The Treatment of Urethral Caruncle. *Minnesota Med.*, 1920, iii, 54.

The author is of the opinion that urethral caruncles are due to chronic irritation or ulceration of the urethral mucosa. As a rule they occur on the posterior and lateral walls of the urethra, only one case being found in the literature in which the caruncle developed on the anterior wall.

The treatment of urethral caruncle has been unsatisfactory and the recurrence after their removal has been high. Some authors have reported the incidence of malignancy as high as 25 per cent in the original caruncle and many malignant recurrences. There are two types of recurrences: (1) true recurrence following incomplete removal of the base, and (2) recurrence in prolapse of the mucous membrane due to the contraction of the scar tissue after the removal of the caruncle. The second type is not a true recurrence.

The author has obtained good results by the following procedure:

The patient is placed in the lithotomy position and the labia are separated after thorough cleansing of the parts and the application of a local anæsthetic. The caruncle is found as a single tag or as posterior and lateral masses. Each tag is picked up with small Graefe fixation forceps and clamped off in the longitudinal axis of the urethra with a special clamp. Care is taken to include all of the caruncle and none of the submucosal structure of the urethra. The caruncle is cut off close to the clamp and the cut surface of the base cauterized with acid nitrate of mercury solution. All the tags are similarly removed. The parts removed are saved for microscopic examination.

The following advantages are seen in this treatment: (1) bleeding does not obscure the field during the operation nor annoy the patient afterward and the operator may be sure that all the growth has been removed; (2) there is a minimum of scar tissue and that which is formed occurs in longitudinal lines separated by islands of healthy mucosa so that prolapse of the mucosa due to contraction of scar tissue is prevented; and (3) the symptoms are relieved almost immediately.

During the last four years the author has treated 118 patients by this method and so far has learned of only four recurrences.

G. S. FOULDS.

GENITAL ORGANS

Herrick, F. C.: Sarcoma of the Prostate. *Ann. Surg.*, 1920, lxxi, 168.

The author gives a brief review of the literature of sarcoma of the prostate and describes a case observed by himself. The patient was a man 33 years of age whose illness began with rapidly increasing urinary obstruction which in two weeks time produced acute retention. For seven months he had used a catheter and during this time had lost 20 lbs. in weight. There was no pain, and blood appeared only occasionally.

Rectal examination revealed the presence of a large, smooth, elastic body. The prostate was removed by the suprapubic route. In three months symptoms of recurrence developed and radium treatment was given. Death occurred two months later. The autopsy showed sarcomatous metastases in the liver and double suppurative pyelonephritis.

H. L. SANFORD.

Parmenter, F. J., and Simpson, B. T.: A Case of Blastomycosis Involving the Prostate and Seminal Vesicles. *J. Urol.*, 1919, iii, 449.

Blastomycosis is a relatively frequent disease, especially in Chicago and its immediate vicinity. Buffalo also seems to have had a comparatively large number of cases. It is a condition, very frequently fatal, in which the skin or lungs seem to be involved primarily and there is gradual extension to other structures, such as the muscles, bones, liver, kidneys, spleen, pancreas, and brain. Death is due to sepsis.

In the cases reported in the literature but little attention was directed to the urinary tract, and although the autopsy reports showed renal involvement in nearly all instances, the clinical records indicate that the urine was normal and no mention is made of any symptoms referable to the urinary tract. In only one reported case was it stated that the organisms were found in the urine during life.

The case reported by Parmenter and Simpson presented extensive involvement of many different structures of the body, apparent recovery under treatment, and unusual involvement of the prostate and seminal vesicles. The patient was 44 years old. In September, 1914, he was taken with a persistent cough, his health began to fail, and he lost in weight. Later he had a profuse mucopurulent blood-tinged sputum and a skin eruption with abscess formation on the extremities, face, and neck. The abscesses were drained, iodides were given, and X-ray treatment was instituted. By the fall of 1917 all evidences of the disease had disappeared.

The urinary trouble began in October, 1917, with an attack of frequency, urgency, burning, and dysuria which lasted about twelve hours. Following this, the patient felt well. In January, 1918, there was a recurrence of the symptoms lasting for a week. A third attack occurred in March, 1918, and the symptoms then noted, though now greatly ameliorated, still persist.

In a urological examination the urine in Glasses 1 and 2 was very small in amount, cloudy, and blood-tinged. It contained also many small prostatic shreds. Rectal examination showed a dense infiltration of the prostate, seminal vesicles, and Denonvillier's fascia associated with considerable oedema and suggesting an inflammatory rather than a malignant process. Upon massage only blood was obtained. Cystoscopic examination showed the bladder capacity diminished about one half. The mucosa was normal except for a bulbous oedema about the trigone, sphincter, and ureteral orifices.

The ureters were not catheterized, but the urine coming from both was clear. The posterior urethra and the verumontanum were acutely inflamed. On later examination the material obtained from the prostate and seminal vesicles showed the typical organism of blastomycosis.

Under X-ray treatment through the peritoneum local improvement continued rapidly, and by July 24, 1918, the prostate and seminal vesicles felt perfectly normal and all blastomycetes had disappeared from the secretion. In December, 1918, an acute epididymitis suddenly developed on the right side. This subsided within two weeks but left the epididymis swollen and hard. In view of the previous findings in the prostate and seminal vesicles, and the fact that gonorrhoea was definitely ruled out, it seems probable that the condition was blastomycosis of the epididymis.

The patient is one of the few apparently to recover from extensive systemic blastomycosis. Only in the epididymis is there any evidence of the disease after four years during which the lungs, skin, muscles of the leg, prostate, and seminal vesicles have been involved. In the author's knowledge this is the first instance in which a clinical diagnosis of blastomycosis of the prostate was made and confirmed during life. Because of the frequent involvement of the kidney by blastomycosis, as shown at autopsy, a more thorough study of the urinary tract is urged. This has been neglected in the past, doubtless because of the prominence of the disease in other organs in patients so ill that urinary symptoms were overlooked.

C. R. O'CROWLEY.

Cathelin, F.: The Comparative Value of Different Prostatectomies (Valeur comparée des diverses prostatectomies). *Rev. gén. de clin. et de thérap.*, 1919, xxxiii, 793.

Each of the standard methods of prostatectomy has its own indications and each has given excellent results. The form of the hypertrophy rather than the volume of the prostate, however, should govern the choice of method. Only two methods of exploration permit a proper estimation of the enlargement of the different zones of the prostate, rectal palpation and intravesical measurement of the gland by means of an instrument devised by the author.

High prostatectomy should be reserved for voluminous prostates projecting chiefly into the bladder in which the hypertrophy involves principally the lateral lobes.

The low perineal prostatectomy should be used for small sclerous prostates which project chiefly into the rectum and are more or less enveloped with adhesions and show no increase in the size of the median lobe.

In cases of retention due principally to hypertrophy of the median lobe of the prostate a less extensive operation should be done. This should consist of thermocautery destruction of the prostatic bar about the neck of the prostate through a suprapubic incision in the bladder.

The statistics of several leading French urological surgeons show that in 509 cases of prostatic hypertrophy the median bar was hypertrophied in 403, the lateral lobes alone were involved in 403, and the anterior commissure in 3. Of the 403 cases of hypertrophy of the median bar the hypertrophy was limited to the median bar in 117, while in 286 cases there was additional hypertrophy of the two lateral lobes.

Deep transvesical ignipuncture recommended by Cathelin was therefore feasible in 406 cases. Removal of the prostatic bar by this method is attended with little risk and the results in cases of complete or incomplete retention are excellent.

W. A. BRENNAN.

Young, H. H., and Waters, C. A.: X-Ray Studies of the Seminal Vesicles and Vasa Deferentia after Urethroscopic Injection of the Ejaculatory Ducts with Thorium. *Bull. Johns Hopkins Hosp.*, 1920, xxxi, 12.

The vast canal system extending upward from the orifices of the ejaculatory ducts in the verumontanum appeared to the authors to present a wide field for study hitherto neglected both in urology and roentgenology. Only in the past few years, they state, has proper attention been paid to the rôle of the seminal vesicles in the production of the numerous types of arthritis, cardiac and gastro-intestinal disturbances, and neuroses. Up to the time of their investigations the assistance to be derived from the X-ray had been practically disregarded.

The purpose of this paper is to call attention to a method by which the vesicles can be injected through the catheterized ejaculatory ducts following endoscopy; to emphasize the fact that, so far as the authors' experience went, no harmful effect followed the use of this procedure; and, lastly, to show that by the injection of thorium it is possible to outline the vast canal system above the orifices of the ejaculatory ducts.

For the past four years Young had been endeavoring by means of specially devised probes, filiforms, bougies of metal and whalebone, and Geraghty's utricule syringe to explore and treat the interior of the ejaculatory ducts, the vasa deferentia, and the seminal vesicles. In these experiments he found that the ejaculatory ducts were easy to locate in most cases even when they were not visible. In several cases of marked stricture of the ejaculatory ducts, systematic dilatations done at weekly or bi-weekly intervals brought about almost immediate relief of chronic pain and discomfort.

In the course of this work the authors were struck with the need for a method by which the condition of the canal system above the verumontanum could be graphically depicted without resort to opening the vas deferens in the groin. When thorium was introduced in roentgenography it occurred to them to use this agent for the purpose of obtaining the much desired pictures.

By using Geraghty's utricule syringe and Young's urological X-ray table it was possible to demonstrate that catheterization of the ejaculatory ducts and radiographic study of the canal system above could be carried out with ease and that it furnishes a ready and satisfactory method for determining the condition of these structures. The process was apparently safe.

From the standpoint of the X-ray, the anatomical structures of interest in the making of vesiculograms were: (1) the verumontanum with the external openings of the ejaculatory ducts; (2) the ejaculatory ducts themselves; (3) the seminal vesicles; (4) the ampullæ of the vasa deferentia; and (5) the vasa deferentia above the ampullæ.

Vesiculograms were prepared from autopsy specimens in order to study the variations in the anatomical structures. The specimens were injected with thorium through the openings of the ejaculatory ducts. The anatomy was clearly shown; the lumina of the ejaculatory ducts were reproduced plainly and the convolutions and windings of the seminal vesicles and the ampullæ of the vasa deferentia were clear and distinct. Variations in the vesicles and vasa deferentia were observed.

The authors state that the method described would be helpful:

1. To determine the patency of the ejaculatory duct or vas in cases of sterility when epididymovasotomy is contemplated.
2. To determine whether stricture of the ejaculatory duct, the vas, or the outlet of the seminal vesicle is present.
3. To disclose the condition of the ampullæ of the vasa or of the seminal vesicles in inflammatory or tuberculous conditions.
4. To show the condition of the seminal tract in cases of vague pain in the region of the prostate, vesicles, or bladder.

G. E. BILLY.

Jacob, O.: The Surgical Treatment of Varicocele (Du varicocele; son traitement chirurgical). *Rev. de chir.*, Par., 1919, lvii, 352.

Anatomical and anatomopathologic study of varicocele shows that it is necessary to create a barrier to the trajectory of the spermatic veins in order to diminish the action upon them of the exaggerated pressure of the blood column. A more or less extensive resection of the group of veins is necessary but the funicular and deferential branches should be left intact. The trunk veins should be resected. Resection of the veins is not enough, however, for special treatment is necessary to correct the excessive elongation of the cord, the exaggerated descent of the testicle, and the distention of the scrotum. These corrections the author believes are best realized by fixing the testicular vein stump to the pillars of the external inguinal ring.

The technique comprises the following steps:

1. An incision similar to that for the treatment of inguinal hernia but not so long.

2. Exposure of the external opening of the inguinal canal and exposure of the spermatic cord.

3. Isolation of the varicose spermatic veins in the cord.

4. Resection of from 6 to 8 cm. of the varicose group, the deferential artery being spared.

5. Fixation of the testicular venous stump to the pillars of the inguinal ring.

6. Suture without drainage.

In 237 cases operated upon by this method since 1919 the author had no serious accident and there has been no testicular atrophy. In some instances a sort of aseptic phlebitis developed in the testicular venous stump but all the patients have been cured and have remained cured.

W. A. BRENNAN.

Johnson, J. E.: New Uses of the Scrotum. *South. M. J.*, 1920, xiii, 120.

Two cases are presented in which the redundant skin of the scrotum was put to novel uses. The first was a case of intractable pruritis ani in which the skin around the anus for about $2\frac{1}{2}$ in. was thick, rough, and leathery from excoriation with the nails. It was necessary to excise the entire area and find a new epithelial covering for the raw surface. The scrotum was drawn well up and the incision made as shown in the illustration. When this flap was straightened out it was about 4 in. long and pendulous from its anterior side. The scrotum was closed with a few mattress sutures. An incision was then made entirely around the diseased anal skin and the skin dissected down to the anal mucosa. This skin was folded together and passed through a median incision in the scrotal flap. The flap having been sutured in place, the anal mucosa was divided and sutured to it, the denuded area being thus covered. Union was primary and on the twelfth day the flap was separated from the scrotum.

The second case was a case of lymphœdema of the leg following an operation for right inguinal adenitis. During the operation the saphenous vein was injured and hæmorrhage was controlled by sutures *en masse*. The leg remained swollen when elevated and it was necessary to find another course for the



return lymph. The scrotum was not swollen. The operation is best described in the surgeon's own words: "The scrotum was divided in the median line, care being taken not to open the tunica vaginalis. The left half of the scrotum was turned down and the end of the right half turned into the left side, thus reforming the scrotum entirely from the right side. The left side now formed a flap 6 in. long with a base of $5\frac{3}{4}$ in. To put this in place the skin of the perineum and an area of skin 4 by 5 in. extending into the right thigh were removed. The flap was now drawn across the denuded perineum and into the denuded area on the right thigh and sutured in place." Union was primary and at the end of two months all the œdema had disappeared.

I. W. BACH.

SURGERY OF THE EYE AND EAR

EYE

Wolff, L. K.: On the Character and Treatment of Scrofulous Inflammations of the Eye. *Brit. J. Ophthalm.*, 1920, iv, 53.

Wolff believes that in phlyctenular inflammations of the eye there has been a previous ocular tuberculous process which has rendered the eye hypersensitive to the toxin of tuberculosis. This toxin is produced by lymph glands inflamed by tuberculosis when the patient's condition is favorable, e.g., following measles. He considers the presence of the staphylococci commonly found in phlyctenular eyes as of secondary importance in the etiology of the condition.

The author's treatment is directed first toward the tuberculous lymph glands and then toward the staphylococci. In the lymph glands the use of the roentgen rays has given excellent results although in some cases recurrence has made it necessary to renew the treatment. The eye itself is treated with a 5 per cent silver fluorescein salve rubbed into the conjunctival sac every hour.

T. D. ALLEN.

Mansilla, S. G.: Injections of Cows' Milk in Ocular Affectious (Inyecciones de leche de vaca en las afecciones oculares). *Med. Ibera.*, 1920, iii, 17.

Injections of sterilized cow's milk have been used successfully in many ocular affections such as acute iritis, infective ulcers of the cornea, post-operative infection, purulent ophthalmia, trachoma, and eczematous keratitis. The author reports 6 cases treated in this way.

1. Case of penetrating wound of the eye with infection. Six injections of from 2 to 3 ccm. of milk were given intramuscularly every other day. By the twelfth day the infection had entirely disappeared.

2. Case of suppurative keratitis due to a foreign body of five days' duration. Five injections of from 3 to 5 ccm. of milk were given in addition to local treatment. The corneal infection cleared up completely at the end of fourteen days and only a thin central leucoma remained.

3. Case of traumatic suppurative keratitis with extensive ulceration. Five injections resulted in complete cicatrization. A small leucoma remained.

4. A case of traumatic suppurative keratitis. This cleared up in fifteen days following 6 injections of milk.

5. A complete abscess of the cornea. After 6 injections of milk the abscess was completely under control and was cicatrizing. A rather extensive leucoma remained.

6. A case of lymphatic vascular keratitis. After 5 injections of milk there was no improvement and treatment was discontinued.

In the cases of infection of the cornea improvement was rapid in the first 3 instances and more gradual in the last 2. Improvement usually begins after the second injection and continues until the fifth or sixth, a period varying from twelve to fifteen days. The first evidence of improvement is the cessation of ocular pain and headaches which allows the patient to sleep. Then follow the diminution and disappearance of hypopyon, the further spread of infection thus being controlled. The pupil becomes dilated, the deep ciliary injection diminishes, epiphora ceases, the exudate from the ulcer clears up, and a transparent surface in a stage of cicatrization remains. In peripheral lesions and those leaving a part of the pupil free, vision now returns.

The use of injections does not interfere with local treatment which should always be employed. Doubtless in the cases cited mydriatics, local antiseptics, subconjunctival injections, cauterization, and extirpation of the lachrymal sac when this was the origin of the infection did much to hasten the recovery.

W. R. MEEKER.

Bussy, L.: Intra-Ocular Ossifications; Remarks on a Frequent Type of Heteroplastit Osteogenesis (Les ossifications intraoculaires. Quelques remarques sur un type fréquent d'ostéogénie hétéroplastique). *Lyon chirurg.*, 1919, xvi, 368.

Bussy outlines the different stages of heteroplastic ossification of the eye as follows:

1. Infection of the ocular membranes.
2. The formation of choroid, retinal, and vitreous exudates and more or less complete capillary necrosis.
3. Transformation of these exudates and the necrosed tissue debris into a fibrous mass abundantly infiltrated with calcareous salts.
4. Traumatic or benign inflammatory excitation of the ocular stump resulting in the formation of new vessels at the expense of the retinal or choroid portions of the eye.

5. Penetration of the calcified conjunctival masses by the newly formed vessels and invasion of these fibrocalcareous substances by conjunctival cells.

6. Arrangement of this material in more or less regular bone layers around the newly formed vessels.

The age of the patient does not have any effect on this process. The condition does not develop indefinitely, however, but is limited by the supply of fibrocalcareous material.

In experiments to reproduce the intra-ocular ossifications in animals the injection of small quantities of Koch bacillus cultures into the vitreous was the only experiment which gave results at all encouraging.

The author attempted also to graft an osteoperiosteal fragment into an animal's eye. The graft lost all of its cellular elements and became a sequestrum which was actively resorbed by the new vessels until it was entirely replaced by young connective tissue. The young connective tissue then became changed and after five months was replaced by new bone. This process was repeated in 8 experiments.

W. A. BRENNAN.

Hiwatari, K.: Concerning the Nature of Trachoma; Together with a Contribution to the Normal Histology of the Conjunctiva. *Arch. Ophthalm.*, 1920, xlix, 82.

In discussing the normal anatomy of the conjunctiva Hiwatari states there is no adenoid layer in the substantia propria, but instead numerous histiocytes of Kiyona and fewer plasma cells of Marschall. The former were considered to be plasma cells, and thus confusion arose, the presence of so many so-called plasma cells leading to the use of the term "adenoid layer." Hiwatari found these histiocytes pre-eminently in the neighborhood of the blood vessels, while the typical plasma cells were scattered sparsely here and there in the subepithelial layer.

Follicles occur in the palpebral conjunctiva because there the epithelial layer is thin and cylindrical while in the globe it is thicker and flat. In one instance the author discovered cylindrical cells in a single layer at the limbus and this fact he believes may account for the few isolated cases of follicles in pannus.

The formation of follicles, however, is not the chief anatomical finding in trachoma. The proliferation of fibroblasts and the formation of scar tissue is equally as, if not more important. The fibroblasts are the earliest to proliferate and their proliferation is a sort of reaction on the part of the tissue to the trachoma virus. The contraction of the fibroblastic tissue shuts off the blood supply of the granules present, the granules soften, and a retrogressive metamorphosis takes place.

Aside from the formation of follicles, the changes in the subepithelial tissue in trachoma consist of a chronic, granulating inflammation with an increase of lymphocytes, plasma cells, histiocytes, and young connective-tissue cells which finally leads to cicatrization.

T. D. ALLEN.

Gifford, S. R.: Atypical Coloboma of the Iris and Choroid. *Am. J. Ophthalm.*, 1920, iii, 97.

After reporting a case of atypical coloboma of the iris Gifford reviews and co-ordinates recent investigations on the embryology of the eye which show that in the normal development of the optic vesicle there are frequently other clefts in addition to the usual foetal cleft. Reference is made to Lindall's extensive work in model making. In these models are found with remarkable constancy four distinct accessory clefts in addition to the normal foetal

cleft. The persistence of any one of these would explain atypical colobomata in any direction.

T. D. ALLEN.

Smith, W. C.: Some of the Complications Following Foreign Bodies in the Eye. *Internat. J. Surg.*, 1920, xxxiii, 59.

Smith reviews the subject of foreign bodies in the eye, noting especially the most common positions of such bodies and the nature of the complications to which they give rise. He speaks of the necessity for care in the removal of bodies from the center of the cornea in order that undue injury and diminished vision may be avoided. He calls attention to the fact that certain metals enter into chemical combination with the fluids of the eye. The soluble metallic salt is often extremely irritating and great care should be taken to remove every particle of it.

Corneal abrasions, although most painful, are often very difficult to see. As an aid in the diagnosis a 2 per cent fluorescein sodium bicarbonate solution should be used to stain such an area. For the treatment of corneal ulcer Smith recommends aseptic cleansing and a tight bandage. In cases of infection, heat (about 150 degrees F.) is beneficial and not injurious to the corneal tissue.

All patients with foreign bodies in the eyeball should be sent to an ophthalmic surgeon but if the foreign bodies are of steel and can be localized, an attempt may be made first to extract them with a giant magnet.

T. D. ALLEN.

EAR

Lillie, H. I., and Barlow, R. A.: Mastoiditis, Acute and Subacute. *Minnesota Med.*, 1920, iii, 23.

This article is based upon a series of non-selected cases, 64 in number, which were operated on between July 1, 1917, and January 1, 1919. The age incidence in this series shows that mastoiditis is not confined to any one period of life. Relatively the same number of cases represented each of the first five decades. In 44 of the 64 cases the abscess in the ear had ruptured spontaneously before the ear was examined.

The indications for operation in the series of 64 cases were significant. In 40 cases the swelling behind the ear pushed the ear outward and the tenderness was exquisite. In other words, the majority of cases bore a diagnostic label. In 14 cases the diagnosis was indefinite from a general standpoint, but definite as regards the ear, extension of the suppurative process being plainly evident.

The complete mastoid operation rather than simple mastoidectomy was done in all instances. The average time for complete healing (drying of the ear and closure of the posterior wound) was thirty-one days. The hearing was improved or remained the same as before the operation in all but 5 cases.

From their study the authors conclude: (1) that early vision of the drum membrane is imperative in inflammatory conditions of the middle ear; (2) that in cases of definite mastoiditis operation is indicated reasonably early, the mortality being practically nil in the uncomplicated cases; (3) that preservation of the hearing function is fairly certain, and (4) that secondary operation is rarely indicated if the mastoid process is exenterated completely.

J. J. KING.

Twyman, E. D., and Giordano, A. A. S.: The Mastoid Operation under Local Anæsthesia; Report of 4 Cases. *Mil. Surgeon*, 1920, xlv, 101.

Six cases of otitis media in which there were 4 cases of mastoiditis requiring operation came under the authors' observation among 540 cases of influenza treated at the U. S. Marine Hospital, Staten Island, N. Y. Local anæsthesia was employed in all of the mastoidectomies and proved highly satisfactory. Although theoretically the fact that the enervation of the tissues is from various directions would make the method difficult, the smallness of the area and the readiness with which infiltration could be done rendered it very easy.

The local anæsthesia given consisted of an injection of $\frac{1}{2}$ per cent novocaine solution with adrenalin and the administration of two hypodermics of morphine sulphate, $\frac{1}{4}$ gr. one hour before and $\frac{1}{8}$ gr. one-half hour before operation. The patients, who were young men between 21 and 29 years of age, made very little complaint during the treatment. There was little after-pain and in no case was additional morphine necessary.

J. J. KING.

Glogau, O.: Radical Operation for Cholesteatomatous Mastoiditis. *N. York M. J.*, 1920, cxi, 64.

Glogau reports an interesting case of cholesteatomatous mastoiditis with a dead labyrinth and facial paralysis in a man 61 years old. During a radical operation an extradural abscess was discovered over the tympanic roof. The dura was covered with granulations and the facial nerve was exposed through the fallopian canal just beneath the external semicircular canal and above the oval window. All the ossicles were gone, leaving the oval window exposed. It was evidently through this region that the labyrinthine involvement had taken place. The next day facial paralysis had disappeared, but twenty-four hours after operation the abdomen became distended and the distention gradually increased until on the fifth day the patient died of paralytic ileus.

O. M. ROTT.

Glogau, O.: The Chances of Cure of Mastoiditis by Tentative Tonsillo-Adenectomy. *Laryngoscope*, 1920, xxx, 83.

Mastoiditis is due almost entirely to middle-ear suppuration, the infection being transmitted by the blood or the intervening aditus and antrum. Except for exanthemata, coryza, and accidental

causes, middle-ear suppuration is due in great part to enlarged and diseased tonsils and adenoids. As the mastoid, antrum, aditus, middle ear, eustachian tube, and adjoining nasopharynx are lined by the same mucous membrane, the causal relation of diseased tonsils and adenoids to mastoiditis is apparent. Enlarged tonsils and adenoids interfere with the levator and tensor muscles of the soft palate. Therefore in the act of swallowing the pharyngeal orifice of the eustachian tube does not open wide enough and as a result rarefaction of the air, serum transudation, and infection occur in the middle ear.

The removal of diseased adenoids and tonsils has been generally advocated as a prophylactic measure against acute middle-ear infections and as a curative measure in chronic infections because of the fact that the tonsillar crypts open into the supratonsillar fossa as well as upon the more exposed tonsillar surface. Since this fossa and the adjacent velar lobe are situated about $\frac{1}{2}$ in. below the eustachian orifice tonsilliths and dried secretion may produce middle-ear disease by pressure or infection. Hence the need for total extirpation of the velar lobe and complete evacuation of the supratonsillar fossa.

With Kerrison, the author holds that in acute tympanic disease offending tonsils and adenoids should be removed at the same time that the tympanic membrane is punctured as the pharyngeal obstruction hinders tympanic resolution. In the small percentage of cases in which adenectomy induces tympanic inflammation the middle ear will be protected by drainage through the incision in the drum membrane.

The author considers simultaneous operation on the tonsils, adenoids, and mastoid dangerous. In cases of acute mastoiditis and hypertrophied and diseased tonsils and adenoids in children not more than 8 years old he suggests a tentative tonsillo-adenectomy. The classic symptoms—high fever, sagging of the superior-posterior canal wall, tenderness and pain over the mastoid region, and sometimes redness and œdema—do not of themselves contra-indicate this operation.

Contra-indications are present, however, in cases showing meningeal or septic symptoms or involvement of the labyrinth or sinus transversus, in cases in which bone necrosis is demonstrated by the X-ray, and in those in which streptococcus capsulatus is the predominant bacterium. In all of these the mastoid operation is indicated at once.

Children upon whom a tentative tonsillo-adenectomy has been done should be kept under observation in the hospital as symptoms may arise which make the mastoid operation imperative. Preceding the tonsillectomy counter-drainage is secured by puncturing the drum. The after-treatment consists of warm antiseptic irrigations within the middle ear, suction, the local application of heat, and general constitutional measures. When the adenoids alone constitute the obstruction the tonsils are not always removed, but when they are, the tonsillectomy is not

followed by any complications. If no symptoms develop other than the usual reflex ear pains, expectant treatment is given. The first symptom to disappear with the ear pains is the fever. The ear discharge then ceases and there is gradual disappearance of the sagging of the canal walls, mastoid tenderness, redness, and œdema.

Even if a mastoidectomy becomes necessary later the author believes that the tonsillo-adenectomy is of value as it hastens healing and recovery after the

mastoidectomy and does away with the need of repeated operations for recurrent infection. If the middle ear is considered a nasal accessory cavity the tonsillo-adenectomy is merely an attempt to secure centripetal drainage.

Tonsillo-adenectomy is logical because it establishes drainage and removes the infective focus.

Histories of 10 of the author's cases are given as evidence of the value of the tentative tonsillo-adenectomy described.

J. D. Cook.

SURGERY OF THE NOSE, THROAT, AND MOUTH

THROAT

Hofheimer, J. A.: Emergency Suggestion—The "Neglected" Uvula. *Internat. J. Surg.*, 1920, xxxiii, 39.

After a brief résumé of the anatomy and functions of the uvula, the author discusses its various morbid conditions.

The uvula may become too short through excessive operation or syphilitic or other ulceration. The curtain between the nasal and oral pharynx is thus made incomplete and regurgitation results.

Elongated uvula is the common morbid type. This usually results from repeated inflammations due to neglected colds, excessive smoking, or irritating foods. Because the condition seems slight, the congestion is allowed to continue through neglect and the uvula's pendant position prolongs it. Repeated attacks result in hypertrophy of the uvular mucous membrane but not of the muscular tissue. The resultant symptoms may be mouth-breathing, frequent desire to cough or swallow, nausea, induced or aggravated tonsil or adenoid disease, or asthmatic attacks. In an extreme case a portion of the uvula was partly swallowed and the muscles of the throat became temporarily fixed in tonic spasm.

Phlegmonous uvula occurs mainly in cold weather in patients giving a history of attacks of rheumatism and whose throat cultures show the presence of staphylococci or streptococci. The inflammation usually begins in the peritonsillar tissue or soft palate. Later the anterior pillar and soft palate become tumefied and the convexity of the latter presents toward the oral cavity. The tumefaction may be slight or one which so closes the faucial isthmus as to render swallowing and respiration difficult. The latter type often presents a transient lockjaw, making operation difficult. In such cases a rectangular cut is usually made in the peritonsillar tumor to reduce the tumor and relax the jaws. The enlarged uvula is then removed.

The infrequent adhesions of the uvula to adjacent portions of the mouth or pharynx usually follow syphilitic ulceration. The nasopharynx has been thus almost totally closed. Adhesion of the uvula to a tonsil may follow acute non-specific tonsillitis.

Tuberculous, and more often syphilitic, ulcers may attack the uvula. Usually the point of this attack is at the juncture with the soft palate. One such case developed gangrenous demarcation and spontaneous amputation of the uvula in four days. Another ulcer at the edge of the bony palate burrowed up-

ward and developed a fistula into the nostril. Later this fistula was partly filled by granulations.

Congenital malformations of the uvula are rare, the most usual being the bifid form.

The not uncommon uvular paresis generally involves the velum palati and results from a central brain lesion, diphtheria, facial paralysis, local disease, or growths. It may be unilateral, bilateral, partial, or complete. When unilateral, the uvula, often with the entire velum, is drawn toward the unaffected side, the faucial arch of which then appears narrower while that of the opposite side appears wider. This distortion is increased during swallowing and speaking. In bilateral paralysis the uvula shows no voluntary action, flaps with the motion of the breath, and is often the cause of snoring and spasms of coughing.

Primary cancer of the uvula is rare but extension from the soft palate, tonsil, or antrum is more frequent. Of the two predominant types, the epithelial is more frequent than the medullary. Early differentiation from syphilis is possible only by tissue examination or a Wassermann test. The prognosis is encouraging only when the involvement is limited to the uvula.

Vascular conditions in the uvula rarely require treatment, as congestion with hypertrophy usually results only in capillary formation. The author's one case of varix showed worm-like vessels extending upward over either faucial arch. Under cocaine anaesthesia, silk ligatures were passed through the velum and brought back on either side so that they encircled the varix and controlled possible hæmorrhage. The uvula was then ablated and the stump drawn together with fine silk. There was no marked hæmorrhage and the varix largely disappeared.

For the usual ablation of the uvula the author uses a long-handled, mouth-toothed forceps and long, blunt-pointed scissors curved on the flat. The parts are anaesthetized and the tongue depressed with an ordinary depressor. The uvula is then grasped by the tip with the forceps and by gentle traction is made to present a concavity upward. In this way the area where the muscle fibers end and the hypertrophied mucous membrane begins is brought out sharply. Here the cut is made with the scissors held at an angle and with their concave surface upward. This angular cut leaves the raw surface directed backward where it is protected during swallowing by the pharyngeal wall. The bleeding is usually slight. If free, it is stopped by a topical application of thromboplastin. A few days later 4 per cent silver nitrate is applied. J. D. Cook.

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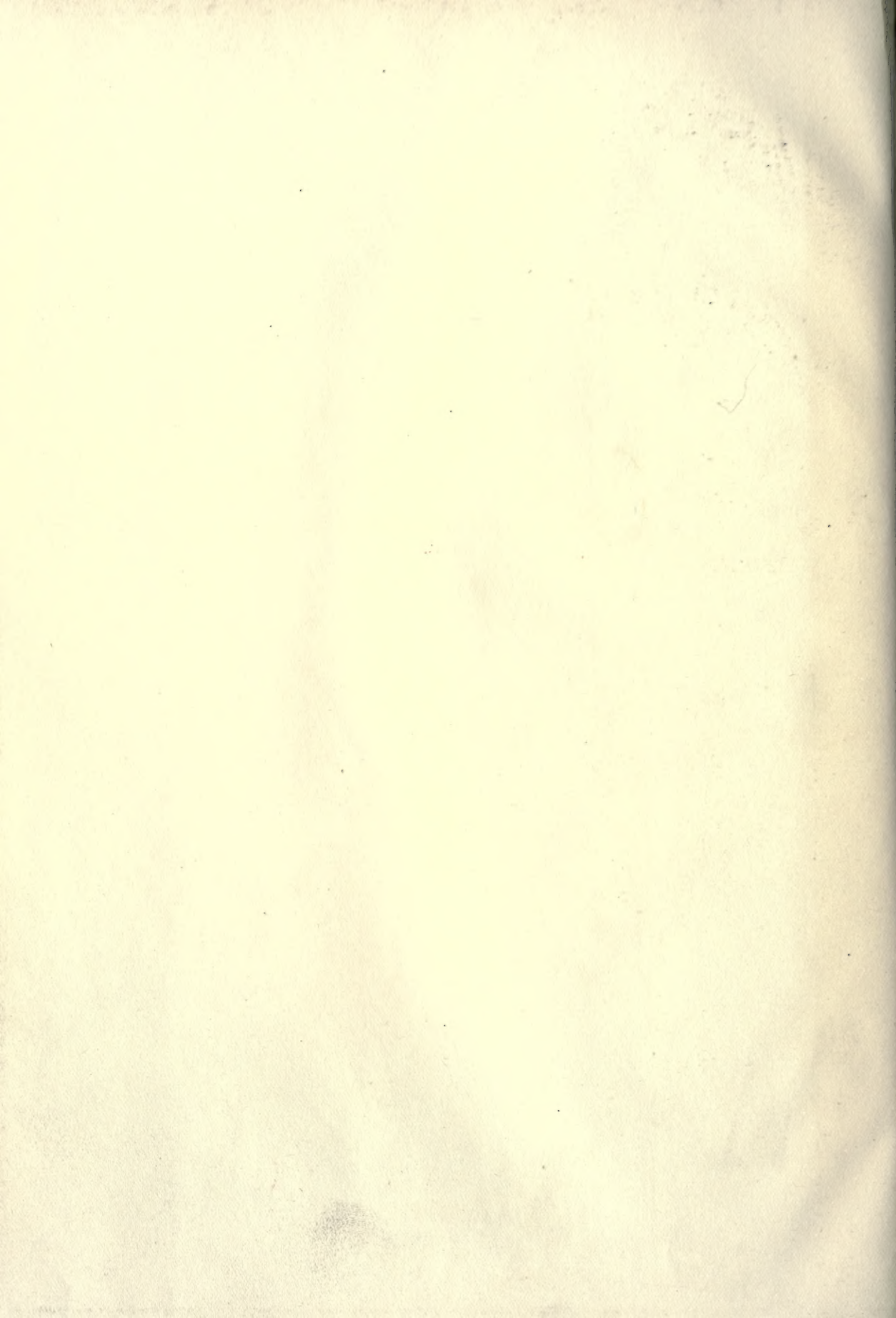
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